Lifestyle Choices That Can Limit the Impact of Tinnitus

10 Tips to Help Manage Tinnitus

Medications That Can Cause Tinnitus

How Your Personality Influences Tinnitus Treatments

Can Marijuana Decrease Tinnitus Distress?

Visit & Learn More About Tinnitus at ATA.org
Wearing a mask with your hearing aids

Here are some clever tips to protect your ears and your hearing aids while wearing a mask.

1. If you have long hair, pull it back into a bun and loop the elastics around the bun.

2. Create a "mask extender" out of fabric or ribbon about 10cm long. Buttons sewn on either side allow for a place to put the elastic other than your ears.

3. Sew 2 large buttons onto a soft headband, placing the buttons to line up with each ear. Looping the elastic around each button will take the strain off your ears.

4. Use masks with string or ribbons that tie in the back. There are YouTube videos on creating masks that tie, which puts absolutely no pressure on the ears.

Communicating when wearing a mask

- Speak slowly, clearly and at a normal volume.
- Rephrase remarks when not understood.
- Take turns when speaking.
- Make sure hearing aid users have them on.
- Keep background noise in the room to a minimum.
- Face each other (at a safe distance).

When removing your mask...

Check to make sure hearing aids are still in place after removing a mask as they may come off with mask removal.

www.oticon.ca
Dear Members, Supporters, and Friends,

You’re reading this issue of *Tinnitus Today* because you are part of the tinnitus community that the ATA works for every day, offering trusted guidance, credible information, and leadership.

Every day, we work with people struggling with tinnitus to deliver the help and support they need to improve their quality of life.

**Today, we’d like to ask you to support the ATA so we can continue our work.**

Here are some levels of giving you might consider:

- Become a monthly supporter at $10, $25, $50, or $100
- Make a one-time donation of $50, $100, $250, $500, or $1,000
- Name a research grant by donating $1,000 (student grant), $3,000 (young investigator grant), or $5,000 (principal investigator grant)

**Thank you for donating to help us continue to help the entire tinnitus community.**

**To Donate**
www.ata.org/donate-now
Prioritizing People With Tinnitus

By Jeannie Karlovitz, AuD

I’ve worked with tinnitus patients for fifteen years so I understand the personal struggles and deep frustrations that so many people encounter when seeking help and basic answers about their tinnitus. Too often people are told incorrectly that since there’s no cure, they’ll have to go home and just learn to live with it. That false statement is devastating for some — shattering all sense of hope — and certainly prolongs the time that it takes for many people to get effective help.

So, when I had the opportunity to join the American Tinnitus Association’s Board of Directors, I didn’t hesitate because it’s a nonprofit dedicated to the person with tinnitus, from helping people find qualified healthcare professionals to funding seed grant research that might someday help tinnitus patients.

During my three years with the ATA, I worked with an amazing array of people from very different backgrounds, which reminded me that we’re more effective working in a diverse setting that has clear goals.

The program that won my heart is the Tinnitus Advisors Program (TinnAP), which was launched about two and a half years ago and modeled on Dr. Jack Vernon, the ATA’s co-founder, setting aside time on Fridays to answer questions from callers. Today, TinnAP is staffed by tinnitus trained audiologists who take turns one day a week, Monday through Sunday, providing free, one-time 15-minute consultations that help a person understand such things as tinnitus management and treatment options, and who in their local community might be able to help.

Just as I’ve encountered in private practice, I’m often the first healthcare professional to actually listen and hear a person’s thoughts and fears about having tinnitus. To be clear, we’re not providing medical advice or pretending to have all the answers in these brief calls. But everything we share is from a place of compassion, deep understanding, and informed by evidence-based research. And since each advisor has knowledge of and experience with effective treatment programs, such as tinnitus retraining therapy (TRT), tinnitus activities treatment (TAT), and progressive tinnitus management (PTM), we’re able to speak from experience that help and improvement for even the most debilitating tinnitus cases are possible.

On occasion, I’ll receive an email from someone I spoke with weeks or months earlier, saying how much the call helped put them on a positive path to restoring their quality of life. That brings me such joy and relief.

The TinnAP is one example of how the ATA is working every day to improve the lives of people with tinnitus. So, no matter where you are in your tinnitus journey, remember that the ATA is here for you in various capacities!

If you don’t feel comfortable calling, draw on our resources that can be found at www.ATA.org. To access Tinnitus Today magazine, which has authentic personal stories, easy-to-understand research summaries, and many other helpful articles, join the ATA. If you think that your individual membership doesn’t really matter, think again. The other thing that impressed me during my three years on the board is that the ATA is almost 100 percent funded by individuals, meaning the ATA is only able to continue its mission through your support. So, thank you for the opportunity you gave me to serve as a volunteer!

Jeannie Karlovitz, AuD, works as an audiologist at Advanced Hearing Solutions in Exton, Pennsylvania. She specializes in the management of tinnitus, hyperacusis, and misophonia. She served as a member of the ATA's Board of Directors from June 2017 to July 2020. She is also a member of the ATAs Tinnitus Advisors Program, which answers calls from people experiencing tinnitus distress. She received her undergraduate degree in speech and hearing sciences from the University of Maryland, College Park, her master’s from the University of Maryland, and her Doctor of Audiology degree from Salus University. Karlovitz is a member of the American Academy of Audiology, Pennsylvania Academy of Audiology, American Speech-Language-Hearing Association, and Tinnitus Retraining Therapy Association.
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FROM THE BOARD CHAIR

Lifestyle Choices Unique to the Individual

In this summer issue we are looking at lifestyle in general and more specifically its tinnitus impact. For some people — and that is the operative phrase here — diet and lifestyle can have a negative, positive, or no apparent impact on tinnitus perception or annoyance. And for some people (lucky or not) there are clear identifiable tinnitus triggers, such as exposure to loud noise or salty snacks, that exacerbate tinnitus. In more than 40 years as an audiologist, I have yet to come across a person with tinnitus who has discovered a magical elixir of food or drink that provides consistent tinnitus relief. Someday we might be able to recommend a research-based tinnitus diet that reduces the sound of tinnitus, but we aren’t there yet.

Research has shown that stress and anxiety can exacerbate tinnitus, and in the age of the coronavirus we are all experiencing more stress just trying to avoid Covid-19. We know that exercise is good for the brain and body, and that anything that compromises cerebral blood flow can negatively impact tinnitus and hearing loss. But for some people exercise is a challenge, because the physical exertion causes their tinnitus to increase temporarily (emphasis on temporarily). But the fear is always there... what if it doesn’t quiet down this time? What if it stays louder? Again, the enigma of tinnitus.

We also know that exposure to nature is good for our health. Right now in Chicago, where I live, the weather is beautiful, inviting us to be outside; and when I’m outdoors, my tinnitus is far less noticeable. Many people — not just some — share this view that being outdoors is indeed “good” for tinnitus. I have often recommended that tinnitus patients use apps that feature nature sounds to reduce the sound of tinnitus, but for me, they hardly compare to the real experience of listening to the sound of waves lapping on the shore or birdsong or the wind in the trees. Our evenings are now filled with the cacophony of crickets and other noisy characters, some of which blend quite well with or even mask my tinnitus. So, take a walk, keep the faith, do something for someone else because it might make you feel good and forget your tinnitus, if even for a moment.

Jill Meltzer, AuD
Chair, Board of Directors

Jill Meltzer
Fostering a Lifestyle of Self-Care

The coronavirus pandemic swept away simple life pleasures that I took for granted, from hugging friends and family, grabbing a cup of coffee, to attending concerts. These small but significant things that I once enjoyed are no longer “safe” and I’m forced to weigh the risks and benefits of interacting with others. It’s unhealthy because we need people, routines, and positive experiences to keep us grounded, to make us feel whole. To manage the ambiguity and added stress, I’ve turned to self-care, something I didn’t always prioritize prior to the pandemic. It’s an inexact art, but it is helping. I hope you too will embrace a self-care routine as an essential tool to help manage tinnitus and the novel stressors connected to Covid-19.

Like tinnitus, self-care is unique to the individual, and what works for me won’t necessarily work for you. There are, however, tried-and-true things — similar to widely accepted tinnitus management tools such as sound therapy — that we can draw on daily to strengthen ourselves mentally and physically.

Some of it is common sense and is backed by decades of research: healthy diet and exercise. While evidence showing the effect of diet and exercise on tinnitus isn’t clear cut, partly because research is limited in this area, these do make a difference for many people with tinnitus. Like tinnitus, there’s no magic pill that can take the place of daily lifestyle choices, such as taking a 10-minute walk or adding another serving of summer vegetables to your plate, that promote long-term improved mental and physical health.

While I’m still discovering my “best” recipe for daily self-care, I’ve found using light therapy in the morning, biking on sunny afternoons, and listening to mindfulness podcasts makes it easier for me to ignore tinnitus, dial down my reaction to stressful news, and fall asleep more quickly at night. I hope this issue of Tinnitus Today magazine helps you discover and embrace self-care as an essential management tool for living well during these challenging times and for managing tinnitus in good times and bad.
Background

Tinnitus is a common and multifactorial condition that requires careful medical assessment and management. Many people with tinnitus believe foods can exacerbate or reduce their perception of the condition, but the research on the relationship between diet and tinnitus is limited.

Objective

The aim of this article is to review the available literature on the efficacy of a healthy diet, use of dietary supplements, caffeine restriction and salt restriction for managing tinnitus.

Introduction

There is very weak evidence that dietary quality affects tinnitus symptoms, and further high-quality analytical studies are needed. On the other hand, the research is clear that dietary supplements are ineffective in reducing tinnitus symptoms and should therefore not be recommended by clinicians. There is also no supporting empirical scientific evidence for the commonly advocated restriction of caffeine and dietary salt for tinnitus patients.

We owe the Greek physician Rufus of Ephesus (c. 80–150 AD) for a precise description of auricular anatomy of the ear. In his work for novice physicians, De Corporis Humani Partium Appellationibus, he used the words “helix,” “antihelix” and “tragus,” which are the anatomical terms that are still in use today.1 As the founder of the systematic anamnesis, Rufus of Ephesus also knew (and practiced) that a detailed nutritional history, especially questions regarding the relationship between symptoms and food intake or certain foods, is essential for patient management and has timeless validity.2 Many people with tinnitus also believe that certain foods can trigger/exacerbate or even improve their symptoms. But does altering diet significantly change the risk or severity of tinnitus?

Tinnitus (from the Latin tinnire, to ring), the perception of phantom sound in the head or ears in the absence of a corresponding external acoustical source, is a common disorder in the general population.3–5 Depending on the applied diagnostic criterion for tinnitus, the prevalence rates in adult populations vary from 11.9–30.3 percent.5 We know that tinnitus is a multifactorial condition — brought on by factors including age; noise exposure; ototoxic medications; vascular problems; genetic predisposition; temporomandibular disorders; or as a consequence of other diseases, such as Ménière’s disease — that requires careful medical assessment and management.3,6

The necessary multidisciplinary management of patients with tinnitus includes strategies such as hearing aids, sound therapy, cognitive behavioral therapy, psycho-educational counseling or neuromodulation; however, potentially beneficial lifestyle modifications are generally not used so far.3,4,6,7 For example, important and effective recommendations such as “patients who have tinnitus should stop smoking” are rarely shared with those in primary care settings.8

Follow Healthy Eating

Healthy fiber-rich dietary patterns and regular physical activity are recommended for tinnitus patients and all other patients.9–11 In this way, the body is supplied with all of the important food components, which is also relevant for the undisturbed inner-ear biochemistry and function, and thus for hearing. For example, the desirable daily portion of whole grain oats not only stabilizes blood sugar levels but also contains abundant magnesium and zinc, the two minerals that have a
major role in neural and central auditory pathways. When considering causes of tinnitus, healthcare professionals should therefore think about disturbances of carbohydrate and lipid metabolism — such as diabetes mellitus, hyperinsulinemia, and hyperlipidemia — that have a negative impact on the inner ear with their microvascular complications (e.g., thickening of the capillaries of the stria vascularis and in the endolymphatic sac).

For example, Spankovich et al. have observed that higher cholesterol and dietary fat intakes are also significantly associated with lower amplitudes of evoked otoacoustic emissions and worse pure tone thresholds. In a recently adjusted cross-sectional analysis of the National Health and Nutrition Examination Survey (n = 2,176), participants with healthier diets (measured by the healthy eating index) had a lower incidence of persistent tinnitus than those with poorer dietary practices (odds ratio [OR]: 0.67; 95 percent confidence interval [CI]: 0.45, 0.98; P = 0.03). An examination of the subscales of the healthy eating index showed, in particular, a significant relationship between reported odds of persistent tinnitus and both healthier fat intake (OR: 0.69; 95 percent CI: 0.49, 0.99; P = 0.04) and fruit intake (OR 0.61; 95 percent CI: 0.41, 0.91; P = 0.02).

There are currently only two other reports of relationships between dietary factors and tinnitus in larger population-based studies. In a U.K. cross-sectional analysis with 171,722 participants, McCormack et al. observed a slight reduction in odds of persistent tinnitus with increased fish consumption (once or more per week), egg avoidance, and higher intake of caffeinated coffee. Conversely, higher intake of fruits or vegetables and bread, and avoidance of dairy, were associated with a small increased report of persistent tinnitus. A lower odds of bothersome persistent tinnitus was only detectable among participants when wholemeal/whole grain bread was consumed rather than white bread (OR 0.86; 95 percent CI: 0.79, 0.94; P = 0.001). The dietary associations were relatively modest and inconsistent in this observational study. In a recent report from the Korea National Health and Nutrition Examination Survey (n = 7,621), tinnitus-related annoyance was significantly associated with lower intake of water (P = 0.038) and protein (P = 0.009).

Some small dietary intervention trials have been shown to reduce tinnitus symptoms in patients with metabolic disorders. For example, Lavinsky et al. evaluated the efficacy of nutritional treatment in 80 patients with associated tinnitus and hyperinsulinemia. A long-term high-protein low-sugar diet, including restriction of fatty foods, resulted in a significant reduction of tinnitus symptoms in hyperinsulinemic patients when compared to participants who did not follow the dietary management (relative risk 5.34; 95 percent CI: 1.85, 15.37; P = 0.000003), regardless of tinnitus intensity. It may therefore be helpful for tinnitus patients to monitor their individual dietary patterns in order to identify potential foods or food groups that aggravate or reduce their symptoms. However, the few published nutritional studies have been characterized by several methodological weaknesses, including lack of control group and no randomization.

A systematic review or randomized well-controlled trial on the link between healthy eating and tinnitus has yet to be performed. Overall, there is very weak evidence that diet quality affects tinnitus symptoms, and further high-quality analytical studies are needed.
Use of Dietary Supplements

Dietary supplements may contain vitamins, minerals, herbs, or other botanicals, amino acids, and certain other substances such as enzymes. Because dietary supplements are legally classified as food, they do not need regulatory approval, and thus come onto the market without regulatory scrutiny of safety, quality, efficacy, and advertising claims. Dietary supplements are readily available and are often labeled “natural,” but “natural” does not always mean “safe.” The use of dietary supplements by individuals with tinnitus (mostly without medical guidance) is popular: ginkgo biloba, zinc, melatonin, and magnesium are the most widely marketed supplements for tinnitus. For example, in an online survey by Coelho et al. of 1788 tinnitus patients from 53 countries, 23 percent of participants reported using dietary supplements to treat tinnitus. Interestingly, 81 percent indicated that supplements are ineffective for tinnitus or even make their tinnitus worse.

The lack of efficacy is unanimously confirmed by several systematic reviews and existing clinical guidelines for the treatment of tinnitus: dietary supplements or herbs do not improve the symptoms of people with tinnitus and can cause serious side effects, especially if taken along with conventional medications (e.g., blood thinners, antibiotics). Dietary supplements may increase or decrease the effectiveness of medication and alter the results of blood or urine tests. According to Cochrane reviews, supplementation with ginkgo biloba or zinc does not relieve tinnitus symptoms and is no more effective than placebo (adverse effects such as gastrointestinal disturbances, headache or allergic reactions may occur). Randomized, double-blinded, placebo-controlled trials also failed to show any effects on the use of antioxidant agents for tinnitus management (e.g., vitamins C and E, β-carotene, α-lipoic acid). Nonetheless, after medications (45%) and hearing aids (9%), dietary supplements (8%) are one of the most widely discussed interventions in tinnitus management with physicians, as shown by a cross-sectional analysis of the representative 2007 National Health Interview Survey.

As a result of the clear research data, the American Academy of Otolaryngology — Head and Neck Surgery Foundation contains the following evidence-based statement in its clinical practice guideline: “Clinicians should not recommend Ginkgo biloba, melatonin, zinc, or other dietary supplements for treating patients with persistent, bothersome tinnitus.”

Caffeine Restriction

For many years, people with tinnitus were advised to avoid caffeine-containing drinks such as coffee, tea, soft drinks, or energy drinks. The main arguments are caffeine’s stimulatory effects on the central nervous system and a potential interaction with central auditory processing (e.g., caffeine can cause a shortening of cochlear outer hair cells). However, there is no supporting empirical scientific evidence for a caffeine restriction recommendation. The few published studies on the link between caffeine consumption and tinnitus are listed in Table 1. So far, only one properly controlled investigation has been performed. None of the studies showed any significant improvement in controlling attacks or delaying progression in tinnitus patients with caffeine restriction. In three observational studies, higher caffeine intake was associated with a lower prevalence of tinnitus. Of course, a causal relationship for a protective effect of caffeine against neuro-otological problems cannot be deduced from these observations.

Salt Restriction

Restriction of dietary salt intake (sodium intake less than 3 g/day) is recommended by many clinicians as one of the first-line treatments for Ménière’s disease and is based on anecdotal experience in the 1930s. Salt is associated with fluid retention and it is currently believed that a low-salt diet may induce an increase in the plasma aldosterone concentration, possibly affecting the endolymph regulation and helping to maintain inner-ear homeostasis (endolymph absorption in the endolymphatic sac). Recent international consensus statements mention a reduced-salt diet as a lifestyle change for Ménière’s disease management, but there is currently no good
supporting evidence for this common recommendation. The search yielded no systematic review and only a single randomized controlled trial.

Acharya et al. investigated three first-line treatment options of Ménière’s disease over three months in a double-blind randomized controlled trial (97 tinnitus patients with a mean age of 47.9 years were randomized into three groups):
- dietary sodium restriction and placebo
- diuretics as amiloride 5 mg and furosemide 40 mg
- vasodilator as betahistine 24 mg.

No benefit could be found attributable to dietary salt restriction alone in terms of hearing improvement, incidence or severity of vertigo, and tinnitus score. However, a systematic Cochrane review* to determine the effectiveness of a dietary salt restriction for the treatment of Ménière’s disease is currently under preparation.

It should be noted that too much salt in food is a worldwide problem. Australia consumes more salt than the recommended level of <5–6 g/day. According to current data, daily dietary salt intake is 10.1 g for Australian men and 7.3 g for women. The main suppliers of salt are bread and processed foods, with 70–80 percent of daily dietary salt found in breads/cereals/grains, meat products and dishes, and cheese, but also in ready-made meals, dressings/sauces and snacks/desserts. Moderate reduction of dietary salt intake also helps to lower systemic hypertension, which is considered a vascular risk factor. There is likely a positive association between tinnitus and arterial hypertension.

Historical View

The existing evidence for nutritional intervention of tinnitus is not very good. As a result of a clear lack of efficacy and the risk of side effects, clinicians should not recommend dietary supplements or herbs for treating patients with tinnitus. There is also no supporting empirical evidence for the commonly advocated caffeine and dietary salt restriction recommendation for tinnitus patients. The paper’s titular question can be seriously answered only with “no”. Well-controlled randomized trials are needed to clarify whether healthcare professionals should ask individuals with tinnitus about their eating habits (food preferences, dislikes, etc.) as part of the physician–patient interaction.

Rufus of Ephesus would certainly support this suggestion today — he would probably complement this with the instruction of a routine nutritional screening in patients’ electronic clinical records in primary care and hospital settings. It may sometimes be useful for healthcare professionals to receive support from Rufus of Ephesus’ Quaestiones Medicinales in the assessment and management of tinnitus patients.

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*Clinical Practice Guideline: Ménière’s Disease, released in April 2020, does not include a salt recommendation for patients. However, it does recommend that patients with MD follow the American Heart Association’s endorsement of limiting daily salt intake to 1500 mg and no more than 2300 mg.

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12. Pulec JL, Pulec MB, Mendoza J. Progressive sensorineural hearing loss, subjective tinnitus and...

Table 1: Studies on the Relationship Between Caffeine Consumption and Tinnitus

<table>
<thead>
<tr>
<th>Authors (Year)</th>
<th>Study Design</th>
<th>Sample Size</th>
<th>Mean Age (Years)</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claire et al. (2010)</td>
<td>A phase 2, pseudo-randomized, double-blinded, placebo-controlled crossover trial</td>
<td>66</td>
<td>59.2</td>
<td>Caffeine abstinence had no effect on tinnitus severity, but acute side effects of caffeine withdrawal were noted (headaches and nausea) and might add to the burden of existing tinnitus</td>
</tr>
<tr>
<td>Petersen Schmidt Rosito et al. (2011)</td>
<td>Transversal case-control study</td>
<td>136</td>
<td>63.8</td>
<td>Daily intake of black coffee (about 2.5 cups per day) had no influence on the degree of discomfort and quality of life of tinnitus patients</td>
</tr>
<tr>
<td>Figueiredo et al. (2014)</td>
<td>Contemporary longitudinal cohort study</td>
<td>26</td>
<td>56.9</td>
<td>There is no justification for the universal restriction of caffeine intake as a treatment for all patients with tinnitus; however, some groups may benefit from consumption reduction (patients under 60 years with bilateral tinnitus and daily coffee intake between 150–300 mL)</td>
</tr>
<tr>
<td>Glicksman et al. (2014)</td>
<td>Longitudinal and prospective study (18-year follow-up)</td>
<td>65,085 (5289 incident cases of tinnitus)</td>
<td>36.3 (at baseline)</td>
<td>Higher caffeine intake was associated with a lower risk of incident tinnitus in women (4–6 cups versus 1 cup of coffee per day); there was no association between decaffeinated coffee intake and incident tinnitus</td>
</tr>
<tr>
<td>McCormack et al. (2014)</td>
<td>Cross-sectional study</td>
<td>171,722 (33,897 incident cases of tinnitus)</td>
<td>57.1</td>
<td>Higher caffeinated coffee consumption was associated with a small lower prevalence of transient and persistent tinnitus</td>
</tr>
<tr>
<td>Figueiredo et al. (2016)</td>
<td>Transversal case-control study</td>
<td>288</td>
<td>58.2</td>
<td>No association between tinnitus and caffeine consumption was detectable</td>
</tr>
<tr>
<td>Lee et al. (2018)</td>
<td>National population-based observational study</td>
<td>13,448 (3642 incident cases of tinnitus)</td>
<td>Age groups (no mean age): 19–39, 40–64, and ≥65</td>
<td>Frequency of coffee consumption had an inverse correlation with tinnitus</td>
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</table>

Complete list of references can be found by using the following link: https://www1.racgp.org.au/ajgp/2019/march/do-dietary-factors-significantly-influence-tinnitus

*Clinical Practice Guideline: Meniere’s Disease was published April 2020. For more information, see https://journals.sagepub.com/doi/full/10.1177/0194599820909438
The Role of Diet in Tinnitus and Hearing Health

A healthy diet and lifestyle are our best weapons in the prevention of cardiovascular disease, but what about their impact on preserving hearing health and lessening the impact of tinnitus? To explore this topic, the ATA talked to Christopher Spankovich, PhD, an expert in this field.

Joy Onozuka (JO): We all understand the importance of eating a well-balanced healthy diet to optimize our long-term physical and mental health. Based on your research, is there sufficient evidence to propose a healthy hearing diet?

Christopher Spankovich (CS): Our diets do indeed influence our hearing health similar to how our diets influence our overall health and risk for chronic disease. Yet, the relationship of diet and specific nutrients in susceptibility to hearing loss and tinnitus (as with other acquired disorders) is complicated and influenced by an array of factors (which influence each other) such as our genetics, environment (including noise exposure), physical activity, lifestyle, and of course our overall health status (both physical and mental). For example, individuals with type 2 diabetes have significantly increased odds of hearing loss. The cascade of biochemical effects created by diabetes can lead to glycation, protein and lipid dysfunction, nitric oxide and glutathione dysregulation, glutamate excitotoxicity, and microangiopathy. It is also likely that an individual who develops type 2 diabetes has dietary and physical activity factors that exacerbate risk for further pathology.

Most of our information on specific nutrients and risk for acquired hearing loss comes from animal models, primarily rodents. This presents a limitation, as animals do not necessarily share the same bioavailability of nutrients; species can vary in regard to how they metabolize, utilize, and excrete nutrients. Let’s consider vitamin C. Vitamin C is an essential nutrient in humans (dietary required) and has numerous roles in our cells: it serves as an enzyme for synthesis of neurotransmitter and neuropeptide hormones, is a cofactor in the hydroxylation and maturation of collagen (healing of musculoskeletal tissue), is an important water-soluble antioxidant, and helps to keep vitamin E in a reduced state. Most rodents (with the exception of guinea pigs) endogenously synthesize vitamin C, meaning they do not require a dietary source. This is all related to a specific gene that encodes L-gulonolactone oxidase (GULO); primates (which include humans) had a mutation in the gene that encodes GULO about $30 \times 10^6$ years ago, so we need vitamin C from exogenous sources (e.g., food). Therefore, a rat model may not be the best to look at dietary vitamin C and hearing outcomes, since their cells make vitamin C on their own.

In general, research has focused on nutrients with antioxidant, anti-inflammatory, or anti-ischemic properties. Perhaps the simplest dietary change that appears to affect susceptibility to hearing loss is caloric intake. Simply restricting caloric intake can significantly reduce evidence of hearing loss and lead to increased longevity in a number of rodent models, but evidence in primates is still under study. Caloric restriction studies often reduce overall calorie intake by approximately 30 percent compared to normal intake but maintain adequate nutrient intake to avoid malnutrition.

Other dietary factors that have been considered include macronutrient intake (fats, carbohydrates, protein) and various micronutrients (e.g., B vitamins, vitamins C and E) and minerals.
Numerous epidemiological studies have demonstrated relationships between specific nutrients and hearing health. Nevertheless, examining single nutrients is not without limitations, namely, existence of interactions among nutrients that create biochemical and statistical collinearities. In addition to epidemiological studies examining population-level relationships, several case-control studies in humans have examined dietary cholesterol changes, folic acid supplementation, vitamin B₁₂ supplementation, and antioxidant supplementations. Many of these studies have shown positive results but had caveats (for reviews, see Spankovich, 2015, and Spankovich & Le Prell, 2020). For example, a folic acid fortification study was completed in the Netherlands that showed some decreased risk for hearing loss, but the study was completed at a time when foods were not fortified in the Netherlands and baseline folate levels were about half of those found in the U.S. population (Durga et al. 2007). Thus, we find another factor, adequate intake of nutrients or role of nutritional deficiency. It should be noted that many foods are fortified, meaning extra nutrients are added. For example, vitamin D in milk. The first food fortified was salt with iodine.

In the United States, true dietary deficiencies in key nutrients are less common, much in part because of accessibility, fortification, and supplements. However, certain nutrients are commonly considered inadequately consumed, including vitamins B₆, B₁₂, C, D, iron, and magnesium. A perhaps greater issue in the United States is excessive intake of unhealthy calorie-dense foods that lack a variety of nutrients, which leads to a person being not only overweight but also malnourished.

**JO:** What are your thoughts on food and supplements?

**CP:** We must consider the source of nutrients, food versus supplement. First, how food is prepared and sourced is a consideration. A question I am frequently asked is whether organic food is more nutritious than conventional. In short, there is minimal difference in nutritional content, but it can vary by specific foods. However, organic foods may have other advantages such as lower levels of pesticide residue.

Supplements are a different story. Most standard vitamin supplements are nature-identical synthetic. Back to our friend vitamin C. The most popular form of vitamin C is ascorbic acid, which is the same as naturally occurring vitamin C. Synthetic and food-derived vitamin C is chemically identical. However, fruits and vegetables that contain vitamin C are rich in other micronutrients, phytochemicals, and dietary fiber. The presence of these other factors may influence bioavailability compared to the synthetic supplement form. For vitamin C specifically, this is not believed to be a meaningful difference in humans, but for other vitamins, such as vitamin E, food sources allow significantly improved bioavailability compared to supplements. Another consideration is the starting material for synthetic supplements is commonly coal tar, petroleum, or acetylene gas that goes through chemical processes to duplicate the structure of the isolated vitamin. Other supplements that are not strictly synthetic can be food based (e.g., vegetable oils) or cultured through raw materials such as yeast/algae or bacterial fermentation. It is important to note dietary supplements are not regulated by the U.S. Food and Drug Administration and therefore the quality of products can vary tremendously. Also, studies on supplements for chronic disease overall do not show much benefit and some show possible harmful consequences.

Rather than focusing on specific nutrients, a likely more effective approach is to focus on dietary...
quality. Eating a healthy diet will include the nutrients described above, as well as an array of other chemicals important to health. Our group previously examined dietary quality through a measure called the Healthy Eating Index (HEI). The HEI is a measure of how well a diet conforms to the recommended dietary guidelines of the U.S. Department of Agriculture (USDA). The HEI has gone through several revisions through the years as the USDA guidelines are updated. In brief, the HEI provides a score of 0 to 100 in regard to quality of diet; higher scores indicate a diet meets USDA recommendations. Putting aside whether you think USDA guidelines are correct or not, there is a relationship between a higher HEI and lower (better) hearing thresholds (Spankovich & Le Prell 2013, 2014). More recently, Curhan et al. (2018) showed that adherence to the Mediterranean diet and Dietary Approaches to Stop Hypertension (DASH) diet reduced risk for hearing loss.

What do I recommend to patients? Eat a healthy diet and exercise, and run any changes by your primary care physician. What is a healthy diet? Eat more vegetables, more fruit, and good sources of fat, such as fish, nuts, and seeds. Eat less processed foods, less fried foods, and less high-glycemic-index foods (e.g., foods with added sugar), and less red meat. These suggestions are in general consistent with the DASH diet and Mediterranean diet mentioned earlier. If you eat healthy and exercise, a multivitamin is generally unnecessary. On the contrary, a multivitamin will not magically correct a poor diet or lifestyle.

**JO:** Does the type of hearing loss matter?

**CS:** Possibly. This is where a supplement may prove to be beneficial. In general, a healthy diet will likely be adequate in diminishing risk for hearing loss as much as it can. Where additional supplements may come into play is when there is a challenge to the system. For example, numerous studies have shown that animals with diets supplemented with antioxidants (e.g., vitamin E) can reduce risk for noise-induced hearing loss. However, the effects of antioxidants on age-related hearing loss have been less clear, with contradictory reports of protection and no protection.

**JO:** Hearing loss has been ranked as the fifth leading cause of years lived with disability, ahead of other chronic conditions such as diabetes and dementia. Given that, should audiologists and doctors be discussing dietary strategies that might enhance long-term hearing health with their patients?

**CS:** Audiologists could benefit from more training in basic biochemistry, system physiology, pharmacology, and nutrition. That training would be helpful for audiologists to feel more confident in discussing factors beyond the ear. The truth is physicians need more training in nutrition also. Unfortunately, most medical schools provide limited training on diet and nutrition.

The ear is not separate from the rest of the body. What we eat and our physical and mental health have important implications for hearing, tinnitus, and balance.

**JO:** Why are people with diabetes more prone to hearing loss and tinnitus?

**CS:** Diabetes causes a cascade of biochemical consequences that can lead to increased risk of hearing loss. To reduce risk, persons with diabetes should following the ABCs of diabetes management, eat healthy, exercise, and follow healthy hearing guidelines. This includes getting your hearing checked and monitoring it over time and using hearing protection and hearing conservation practices (turning down volume) to reduce risk of noise-induced hearing loss.

**JO:** Though there are no foods that cause tinnitus, many people find

“The ear is not separate from the rest of the body. What we eat and our physical and mental health have important implications for hearing, tinnitus, and balance.”

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that such things as salt, caffeine, and alcohol trigger or aggravate their tinnitus. What are your thoughts on that?

CS: Foods or beverages that cause spikes in tinnitus often cause only transient spikes. The majority of work examining salt has focused on Ménière’s disease (MD), but the evidence of salt influencing Ménière’s disease is fairly low (some patients with MD are salt sensitive others not so much), though eating a low-sodium diet is not a bad thing. When it comes to caffeine and alcohol, the key is moderation. Again, a cup of coffee or a glass of wine (not the whole bottle) is not likely going to lead to sustained changes in tinnitus perception. For people who do experience a spike in tinnitus with coffee or alcohol, they need to make a choice. I can enjoy my delicious cup of coffee in the morning and deal with the tinnitus spike or can skip the coffee and not have the spike.

JO: Vitamins and minerals play a role in hearing health. However, there’s no evidence that supplements have any benefit for reducing tinnitus, which is why the American Academy of Otolaryngology — Head and Neck Surgery Foundation wrote in their tinnitus practice guidelines (2014) that “clinicians should not recommend Ginkgo biloba, melatonin, zinc, or other dietary supplements for treating patients with persistent, bothersome tinnitus.” Despite that, patients are sometimes told to take lipoflavonoids because they “might” help. As someone who has worked with tinnitus patients and researched the role of diet on hearing health, what would you like patients to know?

CS: The placebo effect related to tinnitus is considerable, with reports as high as 40 percent. The placebo effect is when an agent with no active substance creates a therapeutic effect due to psychophysiological factors. Another consideration is the lack of an objective measure of tinnitus: we cannot objectively measure a change in the tinnitus signal; rather, we are dependent on the patient’s self-reported perception and reaction. Of supplements, Ginkgo biloba has probably been studied the most. A review of the literature will show contradictory findings, some studies showing benefit and others not. The variation in efficacy can be related to the type of Ginkgo biloba, dosage levels, and having appropriate randomization and placebo-based controls in place. Namely, the Ginkgo biloba extract EGb 761 has been demonstrated to have some efficacy compared to placebo; however, the quality of this evidence is low and hence the recommendation from AAO-HNS. Higher-quality research is needed. Also, a concern with Ginkgo is potential platelet inhibitory actions of the herb that can impair coagulation and thus concern for patients on anticoagulation medications. In addition, there is no evidence that Ginkgo biloba cures tinnitus, though some patients report reduced severity. There are no randomized controlled trials of lipoflavonoids for tinnitus published in the peer-reviewed literature. I therefore do not recommend them to my patients.

I do recommend that my patients eat a healthy diet and exercise. They should consult their primary care physician when making changes to their diet and exercise regime. Exercise-wise, you should do what is within your ability, but be more active.

Will diet and exercise cure tinnitus? No. Will it hurt it? Not likely. If anything, eating healthy and exercising can improve overall health and well-being, improve sleep, and improve the ability of a person to effectively habituate to tinnitus. I rarely see a tinnitus patient who is a vegan marathon-running yoga fanatic. I see many who are overweight, eat below average quality diet, are on multiple medications for high blood pressure/cholesterol/diabetes, and lead sedentary lifestyles. Tinnitus can...
be perceived as an alarming and bothersome percept; let it be an alarm, rather, a wake-up call to start leading a healthier life and taking care of yourself.

Hippocrates said over 2,000 years ago, “Our food should be our medicine. Our medicine should be our food.” That remains true today. Also, Mama Spankovich said while I was growing up, “Eat your fruit and vegetables and go outside and play.” Pretty good advice also.

Christopher Spankovich is an associate professor and vice chair of research for the Department of Otolaryngology and Communicative Sciences at the University of Mississippi Medical Center. He obtained his MPH from Emory University, AuD from Rush University, and PhD from Vanderbilt University. Spankovich is a clinician-scientist with a translational research program focused on prevention of acquired forms of hearing loss, tinnitus, and sound sensitivity. His research has been funded by industry, federal, and professional bodies. He has published over 60 articles and book chapters (41 in peer-reviewed journals) and has given over 60 national and international presentations. Dr. Spankovich continues to practice clinically with special interest in tinnitus, sound sensitivity, ototoxicity, hearing conservation, and advanced diagnostics. He holds adjunct faculty status with Salus University and Nova Southeastern University and serves as an associate editor for Audiology Today and the International Journal of Audiology. He was recently elected to the AAA Board of Directors. He also provides consultant services for medicolegal cases.


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Any information about drugs and supplements contained in the magazine is general in nature, and does not cover all possible uses, actions, precautions, side effects, or interactions of the medicines mentioned. The content of the magazine is not intended as medical advice for individual problems or for making an evaluation for pursuing a particular course of action.

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Teenage Hopes Challenged by Tinnitus

By Cindy Zhang

I am 16 years old, well-versed (-ish) in computers, strong enough to carry stacks of textbooks, and can run an eight-minute mile (if we’re generous). Unfortunately, I haven’t had a moment of silence in years.

Fateful Night

My tinnitus began when I was just in middle school. It slithered into my ears on an ordinary day in the middle of the night, and I remember thinking, Has this whisper always been here? As it turns out, that whisper hadn’t always been there, and that whisper would never leave.

To this day, the cause of my tinnitus remains ambiguous: Was it my constant use of headphones? My days spent in band without hearing protection? My TMJ (temporomandibular joint disorder), which I am still dealing with to this day? Regardless of the cause, the onset of tinnitus plunged me into darkness. Day in and day out, I would fixate on my ears, living in a state of denial about my condition until I could no longer do so. When it finally registered that the hissing was not going away any time soon, the full weight of that realization struck me mercilessly, and I entered a period of purposelessness, anxiousness, and hopelessness.

Above all, a deep sense of loss seized me. I felt like I had lost a part of my youth, a part of my life, and suddenly felt I was aging far too quickly. I felt like my youth was over.

Strangely, I can only recall crying once during this time of grieving. Unlike my tinnitus, my grief and panic were silent, but they were potent enough to convince me that tinnitus had robbed me of my life.

Words Saved My Life

During that tumultuous period, I completely shut myself off from the rest of the world. Instead of reaching out to friends and family, I remained silent about my tinnitus. In hindsight, it would have been far wiser to reach out and communicate, and I implore anyone dealing with tinnitus to do so. For me, however, I scoured the internet in search of a cure. What I ended up with were patient stories — many, many patient stories — with one unifying theme: The power of the mind.

At first, I couldn’t believe what I was reading, but my desperate heart clung to those lessons and stories. My longing for hope loosened the grip of tinnitus on my life. The change wasn’t instantaneous, but I slowly began to take back my life, one moment at a time, harboring that newfound hope that life was still possible.

Finally, there was a day when everything clicked. Everything I had read online in the patient stories became my truth. I can’t recall whether it was a birthday party or a trip to the mall with my friends, but on...
that day, I was completely immersed in my surroundings and happy. So engaged with my life that I had forgotten the hissing noise in my ear.

I learned two lessons that day, which I fully embrace:

• First, that living — truly living — is the greatest cure for tinnitus.

• Second, that stories — real, raw stories — can renew one’s sense of hope and save a life.

How I Cope

Adjusting to life after tinnitus is as much a spiritual ordeal as it is a worldly one.

In the worldly sense, I use many strategies to cope with my tinnitus. When I initially realized I had tinnitus, the first thing I did was buy a pair of high-fidelity earplugs, which reduce loud noise while still allowing me to hear clearly. I bring them with me whenever I know I might be exposed to loud noise.

I’ve also learned to manage my stress. When my tinnitus is louder than it usually is, I step away from whatever I’m doing and walk around a little to clear my mind.

Additionally, I’ve realized (as I’m writing this, in fact!) that I have neglected taking care of my TMJ, one thing I suspect caused my tinnitus. It’s important to take care of conditions that might make tinnitus worse.

Although there are lots of tinnitus management methods, focus on the power of the mind is what brought me to a much better place. It’s a state of constant spiritual adjustment that is needed for me to manage this condition:

Live positively, live responsibly, and read.

Tinnitus does not have to be a condition that engulfs your life. If anything, tinnitus can teach you how to live — and that, above all, is the truest form of youth.

Cindy is a high school student who enjoys writing and spending time with her Mock Trial Team. Though she is definitely future-focused, she says she will never forget the importance of organizations that help people overcome challenges, such as the American Tinnitus Association. In her journey in life, she hopes to give back to the ATA since it helped her to overcome tinnitus.

What’s Your Story?

Every day, people struggling with tinnitus turn to personal stories to understand what the future might hold. The stories are honest, and don’t sugarcoat the challenges and time it often takes to learn how to manage and live with tinnitus.

If your tinnitus has been particularly problematic this year because of the stress associated with the pandemic, we’d like to hear from you. We’re also looking for stories from people who have tinnitus as a result of temporomandibular joint (TMJ) or other dental-related issues. Please send your story to editor@ata.org by Sept. 30. Suggested word length is between 500 and 800 words.
Could Diabetes Be Behind Your Hearing Loss and Tinnitus?

By Robert M. DiSogra, AuD

The number of people in the United States who have tinnitus is approximately the same as those with diabetes or hearing loss. Almost three times as many people are considered “pre-diabetic.” Details and incidence figures can be found in the Centers for Disease Control and Prevention (CDC) National Diabetes Statistics Report: 2020.1

What Is Diabetes?

Diabetes is a metabolic disease caused by the body’s inability to create or effectively use its own insulin, which is produced in the pancreas. Insulin helps regulate blood sugar (glucose) levels — providing energy to body cells and tissues. Without insulin, the body’s cells would be starved, causing dehydration and destruction of body tissues. Cardiovascular, eye, dental, kidney problems, and stroke could occur as well as hearing loss.

Types of Diabetes

There are three types of diabetes: type 1, type 2, and gestational.

* Type 1 is usually identified in young children (although adults, too, can have type 1). They must have insulin delivered by injection or a pump to survive.
* Type 2 is the most common. Approximately 20 percent of people over age 65 develop type 2. Many people with it can control their blood glucose by following a healthy diet and a program of regular physical activity, losing excess weight, and taking medications. Medications for diabetes often change for individuals during the course of the disease. Insulin can also be used to control blood glucose in people with type 2 diabetes.
* Gestational diabetes can occur during pregnancy but usually resolves after delivery.

Diabetes Management

The CDC offers the Diabetes Self-Management Education and Support (DSMES) program to help people with diabetes learn how to take the best care of themselves.2

Hearing Loss and Diabetes

A microscopic blood supply in the inner ear (cochlea) nourishes the hair cells critical for transmitting sound to the brain. When there is too much glucose (sugar) in the blood in diabetes (hyperglycemia), the walls of these tiny vessels close in and get narrower. The narrower the opening, the less oxygen that enters the cells, which can lead to cell damage or death. The result is

“Tinnitus from hearing loss that could be related to diabetes should be of concern to persons under the age of 60. If the hearing loss has an unknown cause, there is a possibility that the loss may be related to pre-diabetes or diabetes.”
the outer hair cells do not function properly.

The term used to describe this narrowing or constricting of the blood vessels in the inner ear resulting from diabetes is microangiopathy (MI-cro-ann-gee-OP-uh-thee). This narrowing — like age-related hearing loss — is a slow, gradual process.

Speech and environmental sounds slowly become distorted. This can happen in all the speech frequencies (loudness and clarity) or just the high frequencies, where just the consonant sounds are affected.

**Diabetes and Tinnitus**

Because tinnitus is a symptom of a problem, establishing a cause is critical.

It is common knowledge that tinnitus can occur from hearing loss or it can be a drug side effect. This is why a person with tinnitus should discuss their tinnitus with their primary healthcare provider, pharmacist, or audiologist.

When the microscopic hair cells in the inner ear do not function properly for any reason (I like the term “short circuit”), tinnitus can result.

If you are younger than 60 years and have tinnitus with or without some degree of high-frequency hearing loss, you may be at risk for diabetes if the cause of the hearing loss can be established. A 2018 study found that 55 percent of people under the age of 60 with diabetes had some degree of high-frequency hearing loss compared to 20 percent of people with the same hearing loss who did not have diabetes.³

For information about your medications’ side effects, speak to your primary care physician or pharmacist or go online to www.drugs.com or www.rxlist.com [not an endorsement by the author or the American Tinnitus Association].

There are more than 80 over-the-counter dietary supplements available that claim to help tinnitus relief or even cure it.⁴ None are approved by the U.S. Food and Drug Administration (FDA) for tinnitus relief. Remember, user testimonials are not a substitute for evidence-based research.

**Diabetes Medications and Tinnitus**

DiSogra and Meece identified 75 FDA-approved medications for diabetes management: 1 inhalant, 22 injectables, and 52 orals.⁵ None had tinnitus as a reported side effect. Therefore, if you have diabetes, tinnitus, and hearing loss, the tinnitus is probably, if not more than likely, a side effect of the hearing loss and not from your diabetes medication.

To view the complete diabetes drug list, go to https://dbobdisogra.com/diabetes-rx-side-effects. The list, current as of May 1, 2020, also shows the side effects that could affect a balance assessment.

**Covid-19 and Patients with Diabetes**

The coronavirus pandemic is still with us. The CDC reports that all three types of diabetes — type 1, type 2, and gestational — may put people at a higher risk of severe illness from Covid-19.⁶ Therefore, the CDC recommends the following actions for patients with diabetes (PWD):

- Continue taking your diabetes pills and insulin as usual.
- Test your blood sugar every four hours and keep track of the results.
- Make sure that you have at least a two-week supply of your diabetes pills and insulin.
- Follow the sick day guidelines for people with diabetes.⁷

The Juvenile Diabetes Research Foundation reports that PWD (type 1) are no more at risk of getting Covid-19 than non-diabetics but recommends that blood glucose and ketones be monitored more often than usual. Also, the foundation does not recommend changing the patient’s medication schedule but recommends that they have more food available.⁸
The American Diabetes Association also recommends monitoring blood glucose and ketones more often than usual for PWD with type 2 diabetes.9

Both organizations also recommend keeping enough diabetes supplies on hand throughout the pandemic.

Summary

Diabetes affects almost as many persons as the number who have hearing loss. There is a wealth of information about diabetes management that is available online from reliable sources, including national adult and pediatric diabetes organizations as well as the CDC.

Tinnitus from hearing loss that could be related to diabetes should be of concern to persons under the age of 60. If the hearing loss has an unknown cause, there is a possibility that the loss may be related to pre-diabetes or diabetes.

All 75 medications approved by the FDA for diabetes management are not suspect as a cause for tinnitus in persons with diabetes.

PWD should monitor their blood glucose/ketones more regularly and have more than the usual amount of supplies on hand during the coronavirus pandemic.

As always, if you have any questions about your hearing or tinnitus, speak to your physician or audiologist.  

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Resources
2 American Diabetes Association: www.diabetes.org
3 Juvenile Diabetes Research Foundation: www.jdrf.org
4 Association of Diabetes Care and Educational Specialists: www.diabeteseducator.org

More Resources from Dr. DiSogra

Listen to Conversations in Tinnitus podcasts with guest speaker Bob DiSogra, AuD, on dietary supplements for tinnitus as well as ototoxicity and tinnitus. To listen, use the following links:
- https://www.ata.org/podcasts/episode-8-part-1-over-counter-medications-tinnitus-relief
- https://www.ata.org/podcasts/episode-8-part-2-ototoxicity-and-tinnitus

Editor’s Note: Dr. DiSogra also authored Ototoxicity: Tinnitus as a Drug Side Effect for Tinnitus Today, Summer 2018, and Over-the-Counter Dietary Supplements for Tinnitus: Do They Really Help? in Tinnitus Today, December 2014.

References
What Does Research Tell Us About Exercise and Tinnitus?

Answered by Fatima Husain, PhD

In short, it's good! That is, physical exercise is good for dealing with tinnitus after onset and throughout one's life if tinnitus has become chronic. This is perhaps not surprising given the latest research on exercise and its favorable impact on aging and myriad other chronic mental and physical health conditions.

In a survey study we conducted some years back, adults reporting milder symptoms of tinnitus also reported higher levels of physical activity compared to those with bothersome symptoms. The survey did not ask the question of whether patients adopted more physical activity to combat tinnitus-related distress, but our findings revealed that although tinnitus contributed to lowered quality of life, exercise appeared to boost quality of life in the survey respondents. A second study using brain imaging found that those reporting mild tinnitus and higher physical activity levels used their limbic system less compared to those with bothersome tinnitus and lower activity levels. The limbic system processes emotions, and using it less on a routine basis is probably a consequence of habituating to tinnitus and also the higher levels of activity.

But exercise is not for everyone. The longer answer, therefore, is that we need more research to understand the nuances of what type of exercise and what duration are suitable for a given individual reporting distressing tinnitus. For some, breathing exercises and yoga may be more their cup of tea. Others may prefer running or team sports. Yet others may eschew physical exercise and relax by listening to music or knitting or reading. All these activities and hobbies have been found by individuals to be useful in helping them deal with tinnitus and improving their quality of life.

Patients seek out these activities on their own, possibly trying different ones, but with little input from their healthcare providers. Again, more research is needed to investigate the contribution of these activities and the manner in which they may be helping a person habituate to tinnitus and deal with it on an ongoing basis. As we know, chronic tinnitus is not always the same, flaring up louder in times of stress and sleeplessness. Exercise and other activities are one way to moderate those flare-ups and have an overall better quality of life.

Fatima Husain, PhD, is a cognitive and computational neuroscientist by training, with a special interest in speech and hearing. For the past 12 years, the major focus of her lab has been the study of tinnitus. Her lab at the University of Illinois at Urbana-Champaign has studied tinnitus using a variety of methods, from behavior and surveys to several types of brain imaging. Dr. Husain's goal is to better understand the brain-based mechanisms of tinnitus with a view toward testing and improving existing treatment options and eventually developing customized treatment plans.

Changes to Diet and Exercise Can Improve Tinnitus

Although the evidence linking healthy eating, exercise, and tinnitus is limited at this juncture, the ATA consulted a nutrition researcher to get his viewpoint on why we should make an effort.

Martin Hofmeister (MH): So far, there’s limited evidence that dietary quality affects tinnitus symptoms, so we need more high-quality analytical studies.1 But it’s well documented that a healthy, fiber-rich diet plays a positive role in overall well-being and helps prevent many diseases, including obesity, gout, diabetes, and cardiovascular diseases. Diabetes mellitus, for instance, is an independent significant risk factor for acquired hearing loss and tinnitus.2

Considering that, being more deliberate in food choices is important. Carrots, tomatoes, and apples not only provide important nutrients but also are low in calories. By adding nuts, whole grains (barley, brown rice, cracked wheat, oatmeal), legumes (chickpeas, lentils, peas, soybeans, and other beans), and fermented dairy products (yogurt, buttermilk, kefir), your diet becomes part of what keeps you well, mentally and physically.

These foods provide ample fiber, vitamins, minerals, and polyphenols, which have a beneficial effect on the intestinal microbiome, which improves the immune system, mental health, and cognitive function (keyword: microbiota-gut-brain axis).3,4 Eating healthy fats, such as vegetable oils derived from rapeseed or olives, and limiting consumption of sugar and alcohol also helps. We also know that cutting out or limiting consumption of processed foods makes a difference.

Unfortunately, it isn’t always clear to patients and physicians that lifestyle changes take an average of eight weeks to become an integrated habit.5 Most people don’t make it to that eight-week mark because they change too much too fast (true for exercise as well), so start with small, incremental changes. For example, a simple and effective tip for creating a long-term behavioral change would be drinking two cups of water (500 ml) before each meal (beneficial effects include increased fullness, lower calorie intake, increased concentration and performance). The mantra should be “I want and can implement a small change in everyday life for eight weeks. And I know why I’m doing it.”5

Also, primary care physicians and other front-line healthcare professionals need to support patients in their efforts to implement long-term lifestyle behavioral principles and goals for nutritional management. And it’s something that applies to physicians themselves in their own lives, considering that almost half of physicians are overweight or obese.6

Joy Onozuka: Is there a strong argument for exercise improving or maintaining hearing health, even with limited research in this area?

MH: Some research has documented that higher levels of physical activity are associated with better hearing acuity and lower levels of tinnitus distress.7–13 Unfortunately, specific exercise intervention studies in this area are indeed rare.14,15 Nonetheless, exercise remains the cornerstone of good health because it significantly reduces the incidence of a wide range of diseases, maintains motor skills, and strengthens our mental health and sense of well-being.

Movement is part of living, so exercise should be viewed positively. It’s an evidence-based preventive and therapeutic tool for reducing the incidence of more than 30 different chronic diseases, including many well-known risk factors for developing tinnitus and conditions associated with tinnitus symptoms such as diabetes mellitus, hyperinsulinemia, hypertension, rheumatoid arthritis, anxiety, depression, and stress. So — please stand up! Right now? You don’t have to sit while reading Tinnitus Today.

Unfortunately, in everyday life, the numerous cardiovascular, hemodynamic, metabolic, endocrinological, immunological, brain-functional, gerontological, and positive psychological adaptations of regular muscle activity lose the fight against the powerful physical law of inertia. Like changes in diet, changes in activity can also be made in small steps done daily. Tinnitus patients, for instance,
are likely to benefit even from simple, whole-body exercises, such as rising from a chair and sitting back down again — without using your arms — for 30 to 60 seconds, twice a day. The key is to do something each day. By consistently making simple and practical lifestyle choices every day, 365 days of the year, significant effects on conditions associated with tinnitus symptoms can be realized (for example, increased blood circulation to the brain).

In my daily routine, I remind myself of the timeless advice expressed more than 300 years ago by the German general practitioner and medical professor Friedrich Hoffmann (1660–1742), who said, “Proper physical activity surpasses all other medicines, which one may recommend only for the preservation of health and for the safekeeping of diseases; and for this purpose can rightly be called a universal medicine, because it not only removes the causes of the disease, but is also a reliable means for the real strengthening and well-being of the body.”

**Benefits of Daily Exercise for People With Tinnitus**

- Exercise reduces stress hormones, such as adrenaline and cortisol, and increases the release of endorphins, causing a person to feel better physically and mentally, which helps reduce tinnitus distress. When stress levels drop, the amplification of sound traveling within the auditory pathway to the brain also decreases. The tinnitus therefore comes across a little quieter, gentler, and less intrusively.

- Physical activity also mitigates common negative side effects of tinnitus, including restlessness, hopelessness, concentration problems, anxiety, and depression. Movement-related neurobiological adaptation processes seem to play a key role in this, including the increased expression of brain-derived neurotrophic factors, vascular endothelial growth factors, insulin-like growth factor 1, β-endorphin, atrial natriuretic peptide, and serotonin. Those who are more actively engaging their muscles are generally more balanced, relaxed, and better able to cope with stress. Hence, exercise makes it easier to cope with various stresses of everyday life — including tinnitus. It also has the benefits of improving self-confidence, self-esteem, and social interactions (community or club sports) and of shifting focus away from tinnitus.

- Engaging our muscles stimulates the heart and lungs and significantly improves blood circulation. This increases the oxygen and nutrient supply throughout the whole body, including the organs and tissues of the inner ear and the brain.

- Exercise improves sleep, which can be disrupted by tinnitus.

- Exercise strengthens the immune system and stimulates the release of anti-inflammatory substances.

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**Martin Hofmeister, PhD**

**Nutrition Scientist**

Martin Hofmeister, PhD, is a nutrition scientist at the Consumer Center of the German Federal State of Bavaria (Department Food and Nutrition), Munich, Germany. He received his doctoral degree in nutritional science from the Technical University of Munich in 2004. Since then he has worked on various nutrition and exercise projects. His research and articles on nutrition and exercise have been published in more than 180 publications, including national and international scientific journals. He is also a reviewer of several international journals.

Quieting the Mind and Tinnitus With Exercise

By Rami F. Odeh, MS

There probably has not been a more stressful and uncertain time than 2020. What we are dealing with is scary and unsettling and has a component of daily change that most people are not equipped to handle.

We spend so much of our day glued to our devices, being pushed and pulled by news and external circumstances that we have zero control over, so it’s no wonder anxiety, depression, and stress levels are at historical highs. And if you have tinnitus, the added stress can make it worse, which is the last thing we need to be dealing with during uncertain times.

What can we do?

It may sound like a weak platitude that all we can do is control the things in our life that we can control.

We all know that exercise is one, if not the, best method to reduce stress and quiet the constant chatter and noise in our heads, which might be tinnitus or negative self-talk, during stressful and scary times. But how much is enough? How much is too much? What type of exercise is the best for stress relief and peace of mind?

How can I find peace of mind with exercise?

Avoid the “have to” syndrome
We are defined by the “shoulds” in our life. We all know exercise is good for us, but some days it might be better to just take a relaxing day off and sit by the pool with a good, inspirational, and uplifting book!

Avoid following other people’s programs
It’s fine to use a sample or ideas from an exercise program but adjust it for your goals and personal limitations.

Learn to be intuitive about your stress
Learn your body’s stress signals. We each react differently to stress, so get in touch with your body’s stress responses and adjust accordingly.

Find a partner (as long as they’re calm!)
Make sure your training partner brings you up and allows “grace” when you cannot make a workout, because flexibility in your workout schedule matters. Don’t partner with someone too rigid who adds stress to your life!

Leave your technology at home
Or leave it in the car, or at the very least put your phone on airplane mode and take an hour off from outside distractions to focus only on yourself.

Get back to having fun!
Play! Do what you enjoy.

What type of exercise is best to quiet my mind?

Proper warm-up and cooldown
One of the mistakes people make with exercise (especially people over 40 years of age who need a longer warm-up and cooldown) is jumping right into their workout with no warm-up. This induces an immediate rise in stress hormones and can actually cause you to burn more blood sugar and less body fat, which can lead to a miserable workout and perhaps make you more stressed after the workout! Make sure you warm up very slowly, with a slow walk, gentle rolling on a foam roller, easy biking, and so on for at least five minutes at the beginning of each workout, and do the same to
cool down your body at the end of every workout.

**Cardiovascular in aerobic zone**
Go at “conversation” pace while brisk walking in nature, swimming comfortably, slowly biking on a flat road (NOT in traffic), and so on. Cardio is one of the best forms of exercise to quiet your mind and relax, but make sure you exercise at a level where you can hold a conversation with someone. If you are so out of breath you cannot talk, you are driving yourself into that stress-hormone-inducing zone that will not be beneficial for long-term stress relief. If you have access to a heart rate monitor, aim for 60–70 percent of your maximum heart rate.

**Yoga**
Yoga is a great option for quieting your mind, just consider that it can be difficult for newcomers, so start with an easy beginner’s class and progress slowly. And look for a class that emphasizes the importance of breathing, another important skill to regulate stress.

**Stretch class**
Stretch classes are another great option, and many free classes are available online. The goal is to hold each stretch for at least 30 seconds. Again, it’s critical to warm up adequately for this activity.

**Weight training**
Lifting weights two or three times a week is very healthy and something everyone could do for health, but, again, don’t push yourself to the point where you start to feel a lot of discomfort when your aim is to destress. It’s key to give your body adequate recovery time, even if that means taking a one- or two-week break.

**What do you really enjoy?**
This should be your “core” exercise. Bottom line, if you love any form of exercise — swimming, running, weight training, dancing, walking, hiking, scuba diving, and so forth — that is what you could do. Don’t do a form of exercise because you “should” or someone said it is the best option for calorie or fat burning. If you like something, you are much more likely to actually stick with it, and exercising will be a way to escape the daily stress, not create another stressor in your life because you don’t look forward to it.

**How much should I do?**

**Allow for adequate recovery**
Recovery is very individual. To determine whether you’re overtraining, measure your resting heart rate after exercising. If it’s 10 beats above normal, take a full day or two off and resume exercise only when your heart rate returns to normal.

**Consider stress levels in other areas of life**
You can adjust your intensity depending on where your stress levels are. If things are going well, you might decide to push yourself to a higher level of exertion. If you are super stressed, then it’s time to focus on calm, taking an easy hike in nature or a walk in a quiet area.

**Follow your intuition, not a rigid schedule**
A schedule is great when things are going well, and it helps a ton with compliance. During high-stress periods, it’s good to have a flexible schedule (for example, a goal to do something every morning before breakfast), but allow yourself (and your training partners) the grace to miss a workout, or change the time of day, if the situation demands it.

**Limited and consistent is better than inconsistent high-volume exercise**
I have seen much better results and a higher level of happiness and peace of mind with clients who exercise 20 to 30 minutes consistently versus those who exercise once a week for 60 to 90 minutes. Inconsistent exercise can actually cause more stress because it is such a shock to your body, and more injuries can occur because your body is not ready for the demands that you’re placing on it. The goal is to just move, simply get outside — the rest will come organically.

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Rami F. Odeh founded FormWell Personal Fitness Training, located in Sandy Springs, Georgia, in 1999. He has helped more than 5,000 clients achieve their exercise and weight loss goals. In 2019, he sold this business to pursue his next dream career: motivational speaking, writing, and coaching. He has dual master’s degrees, one in industrial psychology and the other in exercise physiology, and is certified by the American College of Sports Medicine as a health and fitness specialist. He also worked for 11 years for Northside Hospital in Atlanta as an exercise physiologist in the Outpatient Weight Reduction Clinic and the Diabetes Education Department. He is an amateur triathlete, obstacle course racer, and trail runner. His current life mission is to positively affect the lives of as many people he can, using speaking, coaching, and his three-volume series of published books: *Quiet the Noise: A Trail Runner’s Path to Hearing God*. 

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www.ATA.org
What Do Diets and Tinnitus Therapy Have in Common?

By LaGuinn P. Sherlock, AuD

Most of us have been on at least one diet in our lifetime, to lose weight, to manage a health condition such as diabetes or hypertension, or to simply feel healthier. As you know, diets differ in the type and quantity of food you can eat. Some diets restrict certain types of food, such as food high in fat. Some diets are limited to a given caloric intake. Whatever the case, you must follow the diet to achieve the desired outcome (e.g., losing weight, getting off medication). Some diets are challenging and difficult to implement. Everyone has a different tolerance level for discomfort associated with a given diet (like giving up potato chips on a low-salt diet or pie on a weight-loss diet). Sometimes the desired outcome (e.g., losing 10 pounds) takes much longer (e.g., more than two weeks) than you want, which may affect your ability and motivation to follow the diet. Having realistic expectations about the outcome itself and the time course to achieve that outcome is important for maintaining adherence to the diet.

What do diets have to do with tinnitus? Well, in much the same way that there are different diets with different foods and schedules, tinnitus management strategies involve different “foods” and “schedules.” I will refer to the different strategies as “tinnitus diets.” The key to a successful outcome is finding the “tinnitus diet” that is right for you, one that is compatible with your lifestyle, your preferences, and your desired outcome.

Finding the right “tinnitus diet” starts with realistic expectations. Complete elimination of tinnitus is not realistic in most cases. However, a noticeable reduction in how much tinnitus bothers you, especially a reduction large enough that tinnitus no longer affects you every day, is a realistic goal. Several “tinnitus diet” options are available to help you meet that goal.

It is important to keep in mind that not everyone with tinnitus needs to be on a “tinnitus diet.” If your tinnitus is not affecting your ability to sleep or to concentrate, and if it isn’t making you feel irritable or depressed or anxious, then a “tinnitus diet” probably isn’t going to change anything. If, however, you are affected by your tinnitus, then dedicated adherence to a “tinnitus diet” should result in reductions in awareness of your tinnitus, annoyance with your tinnitus, and difficulty with sleep, concentration, and/or mood. You should also notice an improvement in your overall quality of life.

A number of “tinnitus diet” options can help you achieve the desired outcome, namely, reducing the effect tinnitus is having on your life. “Tinnitus diets” can be self-directed, peer-supported, or professionally directed by an audiologist or behavioral healthcare provider, in the same way that diets can be self-directed or under the direction of a physician, nutritionist, or related provider. The desired outcome and the ability to follow the management protocol are key to identifying the right “tinnitus diet” for you.

Almost all “tinnitus diets” include at least one of the following three components, which have been shown...
to be helpful in reducing the effect of tinnitus on day-to-day living:

- counseling,
- stress reduction strategies, and
- sound enrichment.

Counseling can be informational, interactive, or directive. Informational counseling can help you understand what tinnitus is and, more importantly, what it is not. A better understanding of tinnitus can help you change the way you think about your tinnitus. Interactive counseling may better address the way you think and feel about your tinnitus. Interactions with others who have learned how to manage their tinnitus may be beneficial as well.

The ATA website lists support groups and volunteers available to talk to you about your tinnitus (see appendix). Some tinnitus management therapies provide directive counseling, a type of counseling in which the healthcare provider offers specific advice, guidance, and recommendations. Some people respond better to this type of counseling, while others respond better to a more interactive and patient-centered approach. Non-tinnitus-specific counseling, such as cognitive behavioral therapy (CBT), can effectively reduce your reaction to tinnitus and consequently improve your overall quality of life. Also offered are online tinnitus management programs based on mindful meditation and CBT.

It is important to understand that if you have bothersome tinnitus, your stress response is being activated all the time when it shouldn’t be. The stress response is activated by the perceived threat of tinnitus and is the primary factor affecting your sleep, concentration, and mood. Therefore, it is critical that you identify strategies to reduce your stress response and use them as often as possible. Strategies include deep breathing, progressive muscle relaxation, walking, and listening to relaxing music (see appendix for more details).

Sound enrichment is another component of tinnitus management. Most people with bothersome tinnitus tend to notice their tinnitus often when in a quiet room. The goal of sound enrichment is to reduce the perceptual contrast between sound in your environment (external sound) and the sound of your tinnitus (internal sound). The contrast is much larger when you are in a quiet environment and is therefore difficult for your brain not to attend to it. The more noticeable the tinnitus is, the more bothersome it can become. Sound enrichment can be accomplished by using such things as fans, sound spas, and/or the use of hearing aids, ear-level sound generators, or cochlear implants. Enriching your sound environment will decrease the contrast and over time will help you habituate to your tinnitus so that you do not notice it all the time.

It is important to keep in mind that no single method of tinnitus management helps 100 percent of the people who use it. This is true also for other healthcare treatments and therapies. There are multiple approaches to tinnitus management, so if one “tinnitus diet” does not work for you, try another. “Tinnitus diets” differ in the content and style of counseling, the implementation of sound therapy, and the specific management strategies (e.g., stress reduction strategies) employed. The key to success is finding the “tinnitus diet” that works for you, which depends in large part on identifying your desired outcome. For example, one “tinnitus diet” might address anxiety really well (e.g., CBT), but not problems with hearing, or vice versa. The most cost-effective “tinnitus diet” should be attempted first.

Earlier I mentioned that “tinnitus diets” could be professionally directed by an audiologist or behavioral health therapist. Table 1 is a comparison of “tinnitus diets” directed by audiologists. The chart is not representative of all the “tinnitus diets” available, but those most commonly used are listed. Some of the “tinnitus diets” listed have undergone randomized controlled trials, some provide training for audiologists and allied health professionals, and some have material readily available to you online.

With regard to the “foods” in “tinnitus diets,” sound therapy is not essential but generally results in better outcomes. Hearing aids alone can be as effective as hearing aids combined with sound generators. The specifics of the counseling, which vary from diet to diet, do not significantly impact the outcome. In other words, generic counseling can be as effective as specialized counseling. What has been demonstrated repeatedly is that counseling of some sort plays a significant role in reducing the reaction to tinnitus.

Barriers to accessing audiological tinnitus management therapies exist, including affordability and accessibility. These barriers can be
overcome by utilizing counseling/informational materials that are available online and seeking behavioral health counseling that may be covered by insurance. The affordability of hearing aids is projected to improve with changes in FDA regulations that allow for over-the-counter hearing aids. Although OTC hearing aids are not yet available, other lower-cost options such as direct-to-consumer hearing aids are currently available.

In summary, many “tinnitus diets” are available. No one diet works for everyone. The outcome of the diet may not be exactly what you hoped for, but by adjusting expectations, you have every reason to believe that the right “tinnitus diet” for you will improve your quality of life.

LaGuinn P. Sherlock, AuD, has been practicing audiology since 1991 and has worked with thousands of patients who have tinnitus, both clinically and in research. She has worked at Johns Hopkins Medical Center and University of Maryland Medical Center, and currently works for the Army Public Health Center at Walter Reed National Military Medical Center. Sherlock is studying the effect of tinnitus on concentration, using reaction time and short-term memory tests. She is former Chair of the ATAs Board of Directors and is a current Board member.

Appendix

Table 1: “Tinnitus Diets”

<table>
<thead>
<tr>
<th>“FOODS”</th>
<th>Generic1</th>
<th>TRT1,2</th>
<th>TAT3</th>
<th>PTM1,2,3</th>
<th>ITT</th>
<th>CHaTT2</th>
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<tr>
<td>Audiological evaluation</td>
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<td>Structured interview</td>
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<td>Determination of handicap/functional impact</td>
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<td>Hearing aids/maskers</td>
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TRT – Tinnitus Retraining Therapy (Jastreboff et al.)
TAT – Tinnitus Activities Treatment (Tyler et al.)
PTM – Progressive Tinnitus Management (Henry et al.)
ITT – Integrated Tinnitus Therapy (Sweetow et al.)
CHaTT – Cognitive Habituation Tinnitus Therapy (Bauman et al.)

1 – RCTs
2 – Provider training available
3 – Counseling materials available online

Sources Consulted

Trying to Connect the Dots Between Diet and Tinnitus and Hearing Loss

Summary by John A. Coverstone

Large population surveys provide a wonderful resource to study correlations among a great number of factors at once. A group of researchers from University of Manchester in the United Kingdom, in cooperation with the University of Wisconsin, studied the relationship between diet and tinnitus and hearing loss by using the U.K.’s Biobank resource.1 Biobank includes data on 500,000 U.K. residents, with the diet questionnaire provided to the last 70,000 participants. Participants were adults ages 40 to 69 who completed two to five questionnaires within a year’s time. The questionnaires included many questions about dietary habits and health conditions, including tinnitus and hearing loss. For this study, the researchers selected 34,576 participants based on the researchers’ requirements (completion of both hearing and tinnitus questions, age between 40 and 69 years, minimum completion of two dietary questionnaires, etc.).

Because of the format, respondents self-identified these conditions. Tinnitus was described as ringing or buzzing in one or both ears that lasts more than five minutes at a time and is currently experienced at least some of the time. Hearing loss was based on self-reporting of difficulty hearing. Approximately one-third of Biobank participants completed a test of speech understanding in noise, and these results were found to be similar to self-reporting. Assessment of diet consisted of a detailed questionnaire about 200 common food and beverages consumed in the previous 24 hours. Other health conditions were derived from prior medical diagnosis or common signs and symptoms of the condition.

Analysis of nutrients associated with tinnitus indicated that people eating foods with vitamin B₁₂ were less likely to report tinnitus. People who ate more fat, calcium, and iron tended to be more likely to have tinnitus. The researchers also added reported hearing difficulties as a variable to see whether dietary associations with tinnitus were dependent at all on hearing. However, results did not change significantly. This suggests that any effects of diet on tinnitus are independent of hearing.

Similar to tinnitus, eating fat and saturated fat were linked with more frequent reporting of hearing loss. Eating foods with vitamin D or high protein was associated with fewer reports of hearing loss. As may be expected, when the researchers analyzed the data looking for associations of diet with both hearing loss and tinnitus, similar associations were found with the exception of vitamin B₁₂ correlating with poorer hearing and high-protein diet no longer being associated with hearing.

Further research would be needed, of course, to determine whether the nutrients identified in this study may make someone more or less susceptible to hearing loss and tinnitus or perhaps whether a completely different factor may even be common to each. Perhaps people who eat more poorly are more social and exposed to a greater amount of loud noise. Nonetheless, there appears to be a correlation between diet and hearing loss and tinnitus. This study offers a stepping-stone to more advanced research looking at whether and how we might change diet to be less susceptible to these conditions.

The Link Between Diet and Hearing Loss

Summary by John A. Coverstone, AuD

Research into curing hearing loss continues to progress and show promise for restoring some degree of lost hearing. At the same time, many researchers are looking at ways to strengthen our hearing system in the hope that we might prevent hearing loss from occurring in the first place. For many years, the U.S. military has invested in research into such drugs as D-methionine, an amino acid that has been long investigated by Kathleen Campbell, PhD, of Southern Illinois University.1

More recent breakthroughs include the 2018 publication of St. Jude’s researchers’ discovery of an enzyme that protects rats and mice from hearing loss and the 2020 publication of research from the University of Iowa and Washington University showing that a certain type of hearing loss could be prevented by blocking a chemical receptor in the ear.2,3 Other research has shown positive effects of antioxidants and anti-inflammatory agents in reducing the risk of hearing loss from noise exposure.

However, while it may sound attractive to take a pill or an injection before attending that rock concert or engaging in a military operation with potential combat, all this research raises questions about the role of diet in hearing loss. D-methionine, for instance, occurs naturally in certain animal products, including meat, eggs, and fish. Other nutrients that affect the resilience of our ears may yet be discovered.

Christopher Spankovich, PhD, at University of Mississippi and Colleen LePrell, PhD, at University of Texas at Dallas recently collaborated to provide a more thorough look at the relationship between diet and noise-induced hearing loss, in the hope of providing guidance on healthy eating habits that support healthy hearing.4

They found that early research on this topic involved the relationship of fat and cholesterol to hearing loss. In animal models, high levels of either were associated with a greater likelihood of damage from noise exposure. Deficiency of necessary nutrients has also been shown to make people more susceptible to hearing loss from noise exposure. These are too many to list but include important vitamins and minerals, such as magnesium and vitamins A, B₁₂, C, and E, among others.

Most of these studies came from animal models because it is not ethical to manipulate nutrition in humans. However, some human studies exist to support these findings. One study well known in audiology circles involves the Mabaan tribe of the Sudan, who, in general isolation from modern society, maintained a healthy diet and active lifestyle with very little exposure to loud noise. In a 1962 study by Samuel Rosen of Mount Sinai School of Medicine, tribal members were found to have normal hearing into their 80s. Marcos Goycoolea and others from the University of Minnesota furthered this study in 1982 by showing that inhabitants of Easter Island who had lived only on the island their entire lives had better hearing than island natives who had lived in modern civilization. This was attributed both to differing diets and greater noise exposure in modern society.

Long-term studies of human populations have shown similar results. A notable study published in 2010 followed almost 3,000 inhabitants of the Blue Mountains in Australia for three years, plus follow-up for five additional years to track mortality. This study showed poorer hearing in those with high carbohydrate and sugar intake, estimated by increased glycemic index. In another study, 65,000 women were followed as part of the Nurses’ Health Study II by Brigham and Women’s Hospital, Harvard Medical School, and Harvard T. H. Chan School of Public Health. Researchers found better hearing present in women with higher intake of certain sources of vitamin A. The study also reported that high intake of vitamin C (often termed “megadoses”) was associated with...
poorer hearing. This presents an important note that maximizing intake of nutrients discussed in this article will not necessarily result in better hearing. Other studies have found that recommended intake of vitamin C was associated with better hearing at some pitches.

While a healthy diet is hopefully a goal for each of us, some researchers have studied the effects of poor nutrition also. A study by Ulf Rosenhall and colleagues at the Karolinska University Hospital in Stockholm showed a relationship between junk food and poorer hearing. The researchers also found a positive relationship between eating fish and good hearing. Other studies, as alluded to earlier in this article, have shown poorer hearing correlated with higher body mass index and higher fat mass index, which may be viewed as a consequence of a diet high in fats and processed sugars.

In addition to what people eat, how much is eaten has also been studied. The majority of research involving caloric restriction has been focused on life span/longevity, but some studies have looked at hearing status as well. Spankovich and Le Prell report that there appears to be a “tenting” effect, where moderate caloric restriction has shown benefit for longevity and excessive caloric restriction is detrimental. The effect of caloric restriction on hearing has been varied in different studies, but this is unsurprising, because longevity studies have demonstrated different effects even just within various strains of mice. Much more research will be necessary before any recommendations about caloric restriction can be made for any health benefits.

Although we can see promising outcomes in all this research, there remains much to be done before any recommendations can be made for the general population. As Spankovich and Le Prell point out, multiple confounding factors influence the effects of diet on hearing and hearing loss. Many dietary substances have been studied in isolation without looking at intake or levels of other substances. The interaction of roughly 60 essential nutrients may play a pivotal role in how much benefit is derived from them in our diet. Further, relative levels of each may need to be considered, as we saw with vitamin C earlier. Moreover, diet cannot be completely separated from other lifestyle choices. Exercise is intrinsically linked to the effects of diet, as are any prescribed or over-the-counter medications and supplements and possibly even the unintended absorption of elements in our food, water, and air. Also, potential differences in gender and age may influence recommended dietary changes. Last, the majority of studies summarized here involve animals, and we cannot assume that dietary influences — positive or negative — will translate directly to humans. In fact, the widely varied diets of animals probably indicates that they will not.

As research continues and more human studies are available, we may find sufficient evidence to support specific dietary changes that will improve hearing health. This is a complex problem, though, and a solution will take time to achieve with confidence. In the meantime, the best advice is to follow the U.S. Departments of Agriculture (USDA) and Health and Human Services (HHS) recommendations for a healthy, balanced diet and to protect your hearing whenever loud noise is present.

Can Your Personality Influence Tinnitus Treatment?

Summary by John A. Coverstone, AuD

Tinnitus is an auditory phenomenon heard only by the individual. Therefore, it should not be surprising that psychological distress and disorders are generally understood to be associated with tinnitus distress. Tinnitus treatment must account for the psychological needs of the patient and be targeted to each individual. A distinct characteristic of all people is personality. Although this is not formally assessed or used in directing tinnitus treatment, it would be fair to say that personality to some extent influences most clinical treatment.

A group of researchers at the University of Regensburg in Germany and the University of Zurich in Switzerland studied personality traits and how they relate to treatment outcomes for tinnitus patients.1 The researchers note that several models of personality traits exist, but they chose one that outlines five personality traits: agreeableness, conscientiousness, extraversion, neuroticism, and openness. These were measured using a 60-item questionnaire called the Big Five Index 2 (BFI2). Age and gender were also explored as factors associated with tinnitus questionnaire scores.

The researchers looked at the effects of personality on tinnitus by comparing tinnitus questionnaire scores of patients who visited a tinnitus clinic between 2012 and 2017. The same tinnitus questionnaires were completed by patients in 2018, as was the BFI2. The Tinnitus Handicap Inventory (THI) and Tinnitus Questionnaire (TQ) were used to determine any changes in tinnitus distress between the time of visiting the clinic and 2018. In all, 388 patients were included in the analysis. They were separated into three groups: “clinically improved,” “clinically stable,” or “clinically worsened.”

The researchers found that patients who scored higher in neuroticism were generally associated with worsening tinnitus as measured with both the THI and the TQ. Higher rating of extraversion (which is the opposite of introversion) was associated with improvement in tinnitus distress over time on the THI (but not on the TQ) when compared with scores of those in the “stable” or “worsened” groups. Other personality traits were not reported to have significant association with tinnitus.

The other item that predicted changes in tinnitus scores was time. Each patient’s initial visit to the clinic was anywhere from 2012 to 2017. Therefore, data from initial visit to re-test in 2018 measured change in tinnitus distress over a one-year period, five-year period, or length of time in between. This is a likely reason why time was a predictor of improvement in tinnitus.

These findings suggest that a patient’s personality is related to changes in tinnitus over time. The same personality traits were generally associated with changes in tinnitus whether the patient pursued treatment or not. With additional study in this area, clinicians may be able to tailor tinnitus treatment to the personality type of a patient in order to achieve better outcomes.

1 J. Simões, W. Schlee, M. Schecklmann, B. Langguth, D. Farahmand, & P. Neff. (2019). Big five personality traits are associated with tinnitus improvement over time. Scientific Reports, 9, 18234.
Review by David M. Sykes

Film: In Pursuit of Silence, directed by Patrick Shen (2017)
https://www.pursuitofsilence.com/

Silence is a pipedream for anyone with chronic tinnitus, unattainable yet yearned for. And here we are more than halfway through 2020, emerging from a ghostly, pandemic-induced time of silence and solitude that abruptly reduced environmental noise across the planet by 35 percent — no planes, no construction noise, no traffic, no shouting, and no more cacophonous restaurants. What a strange and wonderful difference.

Like it or not, this “quiet period” was a gift, a once-in-a-lifetime opportunity to travel back in time and revisit the preindustrial world. Was this the dream of quiet we longed for? Did it make your tinnitus better or worse?

Many discovered that it’s not silence we have been seeking, but peace and relative quiet. Long before the pandemic, George Prochnik explored the relational experience of silence and noise in his book In Pursuit of Silence, which Patrick Shen turned into a documentary with the same title.

I was part of an organizing event* that featured Prochnik reading from his book before large audiences of noise-control engineering professionals. At one of these readings was Shen, a fellow seeker of quiet who also has tinnitus. It was a privilege to introduce the two men and then watch them stride off together toward the coffee bar, talking animatedly. Later we helped Shen secure the money needed to produce his film, which was released in 2016 and won awards and praise at international film festivals.

Though the book and the movie share the same title, they are completely different experiences. Both are personal explorations of why quiet matters and what it’s like to make silence a part of your life, as do monks of many faiths as well as some medical doctors, philosophers, and other seekers of solitude.

For Prochnik, the book was a profound journey in search of what “silence” is, who practices it, why it matters, and what life is with and without it. The film is a meditative acoustic journey that explores our relationship with quiet and the impact that it has on our lives.

For many of us, reading is a meditative act — and so is seeing this extraordinary film. So, as we inch our way back to a new normal, take time to explore your relationship with quiet, despite tinnitus.

*Between 2010 and 2016, I worked with the MSF Memorial Trust to produce nine public outreach workshops in major cities, including New York City, San Francisco, Pittsburgh, London, and Tokyo, which were intended to bring attention to the 2011 report from the U.S. National Academy of Engineering, Technology for a Quieter America.

David Sykes is lead author of the book Sound & Vibration 2.0 and a contributor to the National Academy of Engineering report Technology for a Quieter America, the General Service Administration’s Sound Matters, and other books. He is vice chair of The Quiet Coalition and cofounder of LARA, the Laboratory for Advanced Research in Acoustics, at Rensselaer Polytechnic Institute. A graduate of the University of California, Berkeley, with advanced degrees from Cornell University, he served as a member and officer of ATA’s Board of Directors from 2014 to 2017.
Does Tinnitus Truly Interfere With Hearing?

Summary by John A. Coverstone, AuD

One of the most common complaints of people with tinnitus is how much it affects their hearing. This is particularly true of individuals with bothersome tinnitus. However, even people with more mild conditions frequently comment about their tinnitus impacting their ability to understand others’ speech.

Audiologists who specialize in tinnitus know that tinnitus typically occurs at just a few decibels above the softest sound a patient can hear — called the hearing threshold. As a result, clinicians believe that tinnitus probably does not affect hearing itself as much as it distracts patients psychologically or causes them to mistake the effects of hearing loss as tinnitus interference. (See “Distinguishing Between Hearing Loss, Tinnitus, and Hyperacusis,” by James A. Henry in the Spring issue of Tinnitus Today.)

Fan-Gang Zeng, PhD, and his associates at the University of California, Irvine, recently sought to take this idea a step further and see whether the evidence shows tinnitus truly affecting hearing. Their research has been accepted for publication in the Journal of Neuroscience.

To measure the effects of tinnitus on hearing, they had 45 people with tinnitus complete a series of auditory tasks. They also had 27 people with normal hearing and no tinnitus perform the same tasks. Subjects performed an array of auditory tasks, although not all subjects completed all tasks because of time constraints.

Tasks included:
- gap detection, in which an individual identifies whether one or multiple stimuli are presented,
- frequency discrimination, which is a measure of how different in pitch stimuli need to be before a subject can tell them apart,
- intensity discrimination, in which a subject identifies whether stimuli are different loudness,
- masking tasks, which involve identifying stimuli with noise present in the other ear,
- temporal modulation detection, in which a subject attempts to determine whether stimuli are steady or modulated to varying extents, and
- speech-in-noise testing, which consists of repeating words or sentences with background noise present.

One theory of tinnitus interference, developed in animal research, is that animals with no tinnitus can be conditioned to perform a task when they experience a break in an external sound. Then, if an animal develops tinnitus during the experiment, researchers presume it will not change its behavior when there is a break in the external sound because there is instead a persistent sound in the animal’s environment: tinnitus. Therefore, no break in sound is experienced. Researchers often use this theory to determine whether animals develop tinnitus during experiments.

Zeng and colleagues challenged this theory for humans with the assumption that other cues are present in conversation. They proposed that humans (but possibly not animals) would have normal gap detection even with tinnitus present. Temporal cues (spacing between words and pauses in speech) are an important part of verbal communication and some believe tinnitus may affect speech understanding because it occupies the gaps in speech. The researchers wanted to be sure that hearing loss did not contribute to decreased gap detection. They therefore chose 10 control subjects and 11 subjects with tinnitus and compared gap
Interestingly, those with tinnitus and the control group. For most presentations, there were no significant differences between those with normal hearing and 70 dB targets were also relative to each participant's hearing threshold. The 30 dB and 70 dB targets were also relative to the measured frequency of each subject's tinnitus. They found that gap detection in those with tinnitus still did not vary significantly from that of the control group.

Frequency discrimination was measured at 30 dB (soft sound for those with normal hearing) and 70 dB (loud-ish sound for those with normal hearing) above the person's lower threshold of hearing. Stimuli were presented slightly above and below 500 Hz, 2,000 Hz, and 8,000 Hz, as well as at the pitch of the person's tinnitus. Again, no significant differences were found between the control group and the people with tinnitus when pitches different from a person's tinnitus were used. There were some effects of hearing loss on frequency discrimination at 8,000 Hz, which is the pitch most likely to be affected by decreased hearing. However, there were no significant differences in frequency discrimination between the normal-hearing control group and the people with tinnitus when stimuli were matched to people's tinnitus.

Intensity discrimination was also measured at the same loudness and pitches as frequency discrimination, with loudness varied slightly above and below the target levels. The 30 dB and 70 dB targets were also relative to each participant's hearing threshold. For most presentations, there were no significant differences between those with tinnitus and the control group. Interestingly, those with tinnitus had significantly better intensity discrimination than the control group at 30 dB. Zeng thought this might be a result of the more rapid increase in loudness often people with hearing loss experience. He studied this effect further and was able to rule out hearing loss as the underlying factor. Instead, he stated that tinnitus might be the reason people performed better on intensity discrimination tasks than did those in the control group.

Another task involved presentation of a tone with a broadband noise playing. The participant was tasked with detecting the tone each time. A threshold was established at the softest point the tone could be detected. For this task, there was likewise no significant difference in how people with tinnitus detected a short tone in the presence of noise compared with those in the control group. However, a small but significant difference was found when comparing how much louder that stimulus needed to be compared to the noise. This is called overshoot and was compared for all subjects. It was noted for some conditions that the overshoot was greater for those with tinnitus.

When the participants were asked to detect whether a stimulus was modulated (think of a musician using vibrato), there was also no significant difference between those with tinnitus and the control group.

Lastly, people were asked to repeat words presented in a noisy background. This is a common test used in an audiology examination and has been shown to be an effective way to determine if someone has hearing loss. For this task, people repeated phrases the best they could and the score was calculated based on the number of correct responses. Words were presented with three different background sounds present: a noise sound, a competing male speaker, and a competing female speaker. An age effect was discovered when analyzing subjects' ability to understand speech in noise, indicating that the aging process may contribute to difficulty understanding speech in the presence of noise. However, tinnitus did not contribute to any significant differences between the groups.

Dr. Zeng has proposed an attention-normalization model to describe people's perception of the effect of tinnitus on hearing. Essentially, the ear hears external sounds and they are relayed up through the auditory nervous system to the brain. This is called a bottom-up processing strategy because sound begins at a lower level (the nerves connected to the ear) and is carried upward to the brain. Tinnitus, on the other hand, originates in the brain and is processed from the top down. Zeng proposes that these processing pathways may be separate and each may be independently modulated by attention.

The data in this study shows that tinnitus affects only a few of the parameters studied, and only one of those was a negative effect. The other differences noted between people with tinnitus and the control group were an improvement in hearing function. As a result, Zeng concludes that tinnitus does not affect hearing and understanding of speech.

Two and a half years ago, a virus completely changed my life. It wasn’t named or feared or tracked like Covid-19. It was a normal bug, a common-seeming affliction, especially for someone like me who works as a preschool teacher’s aide. In fact, the only reason I sought medical attention while I was sick was because I was also experiencing a hissing and a sense of fullness in my left ear.

I was leaving for Christmas vacation in a few days and wanted to feel better before I left. The nurse practitioner I saw at Urgent Care told me there was fluid in my ear and prescribed antibiotics. No worries, just an ordinary thing. I had an enjoyable vacation, but once home — despite feeling better in general — the hissing noise in my ear persisted.

When I finally saw an ENT after the holidays and my hearing was tested, I was told I had experienced sudden hearing loss in my left ear, most likely brought on by a virus. I honestly didn’t have any sense that my hearing had been damaged. Moreover, it was so out of the realm of my thoughts that my hearing loss would be permanent that I actually wasn’t particularly upset upon hearing the news. I thought I would be prescribed something to fix it, and I would be back to feeling normal soon. Unfortunately, that wasn’t the case.

After several courses of steroids, antiviral medication, an MRI to rule out a tumor affecting my hearing, and finally an injection of steroids straight through my eardrum by a specialist, however, it was concluded that the virus had permanently damaged some of the hair cells in my inner ear. Nothing could be done to reverse my hearing loss and resulting tinnitus.

I learned later that with sudden hearing loss, time is of the essence and it should be considered a medical emergency, similar to if you woke up one morning unable to see. If treated with steroids within the first month of sudden hearing loss, the hair cells have a reasonable chance of healing and hearing can often be restored. Unfortunately, that window of time passed for me before I received the most aggressive steroid treatment, and my hearing loss and tinnitus are most likely a permanent part of my life.

The tinnitus I experience is a constant hissing — like the whooshing sound you hear when you put your ear up to a large seashell or listen to a white noise machine. It never goes away, but it does get louder and more intense with stress, anxiety, fatigue, and exposure to loud environments. When the tinnitus gets more severe, I often experience an ache in my ear, which may be hyperacusis, although that hasn’t been diagnosed.

When I first understood that my situation was most likely permanent, I felt tremendous regret and sadness. Because I might have been able to heal if I had been diagnosed properly in the beginning, I felt a level of responsibility for what I was going through. What if in the beginning I had seen my primary care doctor instead...
of going to Urgent Care? Would a doctor have recognized my description of the hissing noise as tinnitus, when the nurse practitioner had not? Why didn’t I realize that the fullness in my ear was hearing loss rather than just the by-product of being sick? Would I have advocated for more expedient and aggressive care if I had?

All these feelings of self-doubt compounded what I was going through. It took a long time for me to let go of the what-ifs and accept that I did the best that I could with what I knew at the time. I had no idea that a very healthy person could suddenly lose their hearing from what seemed like a common bug, so how could I have expected more of myself?

I think I’ve made peace with my situation, although, perhaps like all grief for things lost, I revisit it every so often. I let myself feel the sadness for a little while and then try to move on and get back to living.

My family has been very supportive and I can tell them when my tinnitus is acting up or I’m struggling with my hearing. I find fractal tones helpful when my tinnitus is particularly loud, so my family knows if they hear the chimes, I might be having a hard day.

I haven’t told too many people about my situation, and when I do it’s usually to explain why I’m having trouble hearing them rather than to let them know I’m suffering from tinnitus. I’ve found that it’s really difficult to explain to people what living with tinnitus is like. People seem to either glaze over when you are telling them about it or they tell you about the time they experienced ringing in their ears, so they get it.

It’s hard not to tell them that unless you live with this all day, every day, you really don’t get it. I know they are trying to relate and that comes from a place of kindness, so I try to receive their goodwill, even though it doesn’t always feel particularly helpful.

I stay active and busy, which helps my tinnitus take a backseat to other more positive things. I try not to think about having tinnitus for the rest of my life and instead think only about dealing with the day at hand. It’s an ongoing journey. And, though I still hope for a medical breakthrough that will eventually silence my tinnitus, I’m proud of how far I’ve come in dealing with it so far.

Support the American Tinnitus Association by Shopping at AmazonSmile

When you’re shopping for friends and family on Amazon, the American Tinnitus Association hopes you’ll link your shopping account to AmazonSmile, the online retailing company’s generous program that enables you to shop and contribute to your favorite nonprofit organization at the same time. Amazon pays all program expenses and donates half of a percent of the cost of your eligible purchases to your favorite earmarked charity. Won’t you choose the American Tinnitus Association to help us advance tinnitus research and treatments? https://smile.amazon.com/ch/93-0749558
Grieving Over the Loss of Silence

By Shelley F. Knight

Grief cannot be defined in one simple sentence, because grief is not simple. It is a vast and complex topic, with equally vast and complex presentations in terms of signs and symptoms, longevity and intensity. And grief is not exclusively triggered by death. Grief can ensue when we lose anything we had an emotional connection to, including good health. In the case of tinnitus, our sense of diminished health can lead to a grieving process, and because the signs and symptoms of tinnitus are akin to grief symptoms, we are often subjected to a compounded experience of grief when it accompanies tinnitus.

The onset of tinnitus and its grief entanglements can affect us physically, mentally, emotionally, and socially. We may experience dizziness, depression, loneliness, hopelessness, irritability, anger, restlessness, insomnia, or a change in our ability to communicate. We may experience a loss or lack of control, confidence, trust, or focus.

These signs and symptoms of tinnitus — or grief — can cause us to struggle with basic activities of daily living, as well as hobbies, personal connections, work routines, and other essential aspects of our lives. These adjustments can lead to a decline in our mental health, because we feel frustrated, anxious, and depressed about what once was, our current reality, and our uncertain future.

Our grief journey may go unnoticed by those around us, just as our invisible tinnitus does. Although it may be easy for some to dismiss tinnitus because it’s not tangible, the weight we carry in our daily lives with the condition can feel overwhelming and isolating.

On the rare occasions we find the courage to share our feelings on the
burden of chronic tinnitus, people are typically unprepared to deal with our diagnosis or our associated grief, and they may downplay or dismiss our daily struggles or compare them to their own struggles. We are told that we will need to either get over it or get on with it, or we’re provided with a plethora of suggestions that we have already tried and tested without success. This lack of understanding within our circle of connections can lead to feeling misunderstood, which only consolidates the grief within us.

Some of us will choose to isolate ourselves and embrace sheer determination to carry on with our diminished sense of health, while others may fall deeper into the darkness of depression and feeling overwhelmed, some even contemplating suicide to put an end to the never-ending noise.

Yet, when we are isolated from our circle of support, be it consciously or subconsciously, we are still able to reach out to others and seek help during times of dire need and frustration.

However, this safety net has changed of late in the midst of the pandemic. Throughout my thirty-year healthcare career, I have observed many presentations of grief, but with the coronavirus pandemic, a new form of grief is on the rise, one I refer to as isolation grief. This multilayered form of grief can manifest in many ways, including as a feeling of a loss of control in life as our everyday choices are now dictated by governmental requirements. We are isolated from the known world around us, left home alone with the unrelenting sound of tinnitus.

In addition, many of us are facing change in or loss of a job, income, social interaction, access to medical appointments, freedom of travel. Some of us have experienced a supreme loss: the death of friends and family members. All of these are life-changing factors, and all of this while we endeavor to function with tinnitus, where we are alone with our ongoing buzzing, ringing, whooshing, humming, hissing, or whatever sound we might hear, without the distraction of our daily routine.

What I have observed is that no matter what life throws at us, we are stronger than we realize. While you may be reading my words from a place of great despair, please know that you are more capable than you know. If you find yourself in grief, because of tinnitus or loss of normalcy, know that you will come through this.

As with any grief experience, we are not stagnant, and as reliably as the night turns into day, you have the strength to come through the dark and into the light. Your grief journey is as unique to you as your fingerprints, so how you overcome these challenging times will be based on your life experiences — you have a 100 percent success rate to date.

Do not aim to change your health and existence in one day; instead, choose one aspect of your life to change: self-care. Self-care is not selfish care. It is a deliberate act to look after your physical, emotional, and mental health before anything else. For today, take time for you, be it to read a book, have a bath, journal your thoughts, listen to a guided meditation, claim a day of rest, cook yourself a wholesome meal. For today, nothing else matters but you.

Shelley F. Knight is a once-upon-a-time nurse turned author, writer, and podcaster who provides an eclectic blend of clinical, holistic, and spiritual expertise in her specialist subjects of positive changes, spirituality, and grief. She is author of Positive Changes: A Self-Kick Book, host of Positive Changes: A Self-Kick podcast, founder and host of Good Grief — Northampton Death Cafe, and a freelance writer for international magazines.
How Do We Know If Covid-19 Has a Negative Impact on Tinnitus?

By Thomas L. Eby, MD, and Christopher Spankovich, PhD

Although much remains to be learned about the variety of symptoms caused by the Covid-19 virus, direct effects on hearing or tinnitus appear to be uncommon. One recent report from Egypt found minimal high-frequency hearing loss associated with asymptomatic patients diagnosed with Covid-19; however, study design and lack of adjustment for age and sex limit interpretation of the findings. It is plausible that treatments for the virus may cause temporary tinnitus or hearing loss and exacerbate existing tinnitus.\(^1\) Notably, treatment with chloroquine compounds, which was initially advocated for treatment, has the potential for this side effect. Ototoxicity has also been reported and should be monitored in Covid-19 patients treated with these drugs. Chloroquine and hydroxychloroquine have been registered for more than 140 clinical trials for treatment of Covid-19.

A recent review of hydroxychloroquine ototoxicity in France revealed 23 cases, but most only developed after months or years of treatment, which is longer than the treatment approach in Covid-19 treated patients.\(^2\) Of the five patients that developed symptoms within 14 days, hearing loss was associated with tinnitus, vertigo, or imbalance and in one case headache. All otologic symptoms except in one patient resolved after cessation of the therapy. The cases of irreversible sensorineural hearing loss associated with hydroxychloroquine were in patients who had treatment over several years.

Based on literature of patients treated for other conditions with synthetic quinine-based drugs, we can expect potential otologic side effects from these medications in patients treated for Covid-19. During treatment, patients may have mild hearing loss, sometimes unilateral with tinnitus, and possible dizziness or imbalance. These symptoms should resolve with completion of treatment; however, it will be important to monitor them and support patients with these otologic side effects and follow up with those whose symptoms do not resolve. It is also worth noting that several trials reported limited effectiveness of hydroxychloroquine in management of Covid-19 and enthusiasm for its use is waning publicly in the United States.

Beyond quinine-based drugs, it is plausible that illness from Covid-19 and other treatments may exacerbate perception of tinnitus in patients who already have this condition. Persons with existing tinnitus may also experience exacerbation of their symptoms related to increased stress. The mental health effects of diminished social interaction and depression/anxiety related to the cascade of events created by the pandemic (e.g., unemployment, loss of family/friends, substance abuse) may make dealing with tinnitus even more difficult for persons with and without Covid-19. Furthermore, persons with hearing loss may be frustrated by communication difficulties created by use of face masks in public and healthcare settings and attribute these issues to their tinnitus perception. For tinnitus, we recommend patients talk with a knowledgeable provider about management strategies, including stress reduction, sound therapy applications, and counseling or formal therapy. Much of this information can be provided to patients through telehealth. For patients with hearing loss and tinnitus, communication repair strategies, assistive listening devices (hearing aid to smartphone apps), and use of clear masks may be beneficial.
in overcoming distortions in speech created by use of masks.

Thomas Eby, MD, is professor of otolaryngology and neurology at the University of Mississippi Medical Center. He is an otologist and neurotologist, with more than 30 years of experience, including an active clinical practice and interest in clinical research and otology education. He obtained his MD at the University of Wisconsin and completed his otolaryngology residency at Massachusetts Eye and Ear Infirmary, where he also did a research fellowship in temporal bone pathology. He completed a neurotology clinical fellowship in Zurich, Switzerland. He has multiple publications and is associate editor for Otolaryngology – Head and Neck Surgery.

Christopher Spankovich, PhD, is an associate professor and vice chair of research for the Department of Otolaryngology and Communicative Sciences at the University of Mississippi Medical Center. He obtained his MPH from Emory University, AuD from Rush University, and PhD from Vanderbilt University. Spankovich is a clinician-scientist with a translational research program focused on prevention of acquired forms of hearing loss, tinnitus, and sound sensitivity. His research has been funded by industry, federal, and professional bodies. He has published over 60 articles and book chapters (41 in peer-reviewed journals) and has given more than 60 national and international presentations. He continues to practice clinically with special interest in tinnitus, sound sensitivity, ototoxicity, hearing conservation, and advanced diagnostics. He holds adjunct faculty status with Salus University and Nova Southeastern University and serves as an associate editor for Audiology Today and the International Journal of Audiology. He was recently elected to the AAA Board of Directors. He also provides consultant services for medicolegal cases.

Common Medications That Can Cause Tinnitus

By Sharon E. Orange, MD, MPH

Though relatively rare, tinnitus can be a debilitating side effect of a handful of common medications, so you and your physician should both take this potential adverse reaction seriously, particularly since tinnitus treatment options are limited. Medications known to cause tinnitus or hearing loss are considered “ototoxic medications.” Discontinuing these medications can prevent tinnitus and hearing loss progression, though the ringing may not always go away. For essential medications, such as blood pressure, chemotherapy, and heart failure, the rare tinnitus side effect is a risk worth taking. For the treatment of pain, infection, depression, and anxiety, however, alternative equivalent options are worth discussing with your doctor. Please note that tinnitus resulting from medications mentioned in this article typically subsides with discontinuation of the drugs but in rare exceptions, as is the case with Gentamicin, the tinnitus may be permanent. Here is what you need to know.

Aspirin and NSAIDs
Aspirin and nonsteroidal anti-inflammatory drugs (NSAIDs), such as naproxen (Aleve) and ibuprofen (Motrin, Advil), are known to cause ringing in the ears. NSAIDs have been implicated as potentially harmful to outer hair cells and cochlear blood flow, but this occurs at higher doses for longer periods of usage.\(^1-3\) High-dose aspirin (6 to 8 grams per day) can cause tinnitus and hearing loss that is reversible with discontinuation of the drug. For this reason, if you take daily low-dose aspirin (81–160 mg per day) or NSAIDs for short periods of time for pain, it is unlikely you will experience tinnitus as an adverse reaction. The same goes for the similar COX-2 inhibitors such as meloxicam (Mobic), which appears to carry very rare (<2% tinnitus) risk.

Benzodiazepine Anxiety Medications
Alprazolam (Xanax), diazepam (Valium), and lorazepam (Ativan) are benzodiazepines, which are helpful for the short-term treatment of anxiety. Rather than causing tinnitus while you are taking them, a complication of benzodiazepine withdrawal is ringing in the ears and most often occurs in folks who’ve been taking the drug for longer periods of time.\(^4\) For prevention of benzodiazepine withdrawal-induced tinnitus, tapering off the drug may help prevent this, and a dose reduction of 10 to 25 percent every 4 weeks has been suggested.

Tricyclic Antidepressants
Tricyclic antidepressants, including amitriptyline and nortriptyline, are used to treat depression, anxiety, chronic pain, and migraines, but they may cause ringing in the ears. Amitriptyline in particular has been reported to cause persistent tinnitus.\(^5\) This is an area worth discussing with your physician because these are older antidepressants and the newer selective serotonin reuptake inhibitor (SSRI) antidepressants may be a better option without the tinnitus risk. In fact, SSRI antidepressants have been studied (though not shown to have significant benefit) for the treatment of tinnitus.\(^6\)

Isotretinoin
Isotretinoin (Accutane, Claravis, Absorica, and others) is an oral medication used for severe acne, and its use may lead to tinnitus.\(^7\) This is rare and resolves after discontinuation, but starting with other topical acne therapies or hormonal methods instead may avoid this potential complication.\(^8\)
**Loop Diuretics**

Loop diuretics, such as furosemide (Lasix) and bumetanide (Bumex), are commonly prescribed for swelling in the legs, heart failure, and to lower blood pressure. Use of loop diuretics can cause tinnitus but it is usually temporary. These are essential medications you wouldn’t stop without discussing with your doctor. Here again, ototoxicity is primarily seen in folks treated with high intravenous or oral doses of loop diuretics, so you may discuss with your doctor starting at the lowest possible dose and increasing as needed.

**Antibiotics**

- **Broad-Spectrum Antibiotics**
  - **Gentamicin and Tobramycin**
    Gentamicin and tobramycin are antibiotics used for the treatment of severe bacterial infections and are a well-known cause of tinnitus and vertigo, along with hearing loss. Widespread use of these two antibiotics is limited because of the availability of alternative, less toxic agents with comparable efficacy. It is important to note that gentamicin or tobramycin (Tobrex) eye drops do not carry the tinnitus risk nor does topical gentamicin cream or ointment used for skin infections.

- **Macrolide Antibiotics**
  - **Azithromycin and Clarithromycin**
    Azithromycin (Zithromax or the Z-Pak) and clarithromycin (Biaxin) are antibiotics prescribed for bacterial infections, such as pneumonia, sinusitis, and bronchitis. In addition to the older medication erythromycin, all have been reported to cause hearing loss and ringing in the ears. Again, tinnitus appears to be linked to higher doses used for longer periods of time.\(^9\) If you are prescribed one of these antibiotics for short-term use, your risk of tinnitus appears to be very small.

- **Ciprofloxacin**
  The fluoroquinolone antibiotics ciprofloxacin (Cipro) and moxifloxacin have been reported to cause tinnitus.\(^9\)\(^10\) However, there is some good news: Those reports have not carried over to a similar antibiotic, levofloxacin (Levaquin). Cipro is prescribed for bacterial infections like urinary tract infections, acute sinusitis, and pneumonia.

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**For more information on medications, supplements, and tinnitus, see Tinnitus Today, Vol. 43 (2), Summer 2018.**

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Use of marijuana is increasing in the United States as more states legalize the drug for medical and/or recreational use. As a result, people are able to experiment with the drug as a home remedy for a wide array of conditions. However, marijuana continues to be illegal by federal statute and formal research is therefore limited as a result of the unavailability of federal funding.

A pair of researchers at Stanford University/Stanford Ear Institute wanted to see whether an association between marijuana use and tinnitus could be established. They used existing data from the 2011–2012 National Health and Nutrition Examination Survey in the United States. They chose that year’s survey because it was the latest data set that included hearing information at the time. (Note: The 2015–2016 NHANES data also includes hearing testing and questionnaires but was published November 2019 — after this study was completed.)

They pulled survey data for individuals aged 20–69, and included information from 2,160 individuals in their study. In addition to hearing test results and tinnitus, the authors looked at data for history of noise exposure, smoking, marijuana use, alcohol and other drug use, mood, depression, and more.

A relationship was found between tinnitus and marijuana use among people who used marijuana at least once per month in the preceding 12 months, with such individuals being more likely to experience bothersome tinnitus than the general population in the survey.

When considering people who used marijuana, tinnitus was not found to be associated with either frequency or amount of the drug used. When looking at individuals with tinnitus, marijuana use was not associated with severity or frequency of tinnitus occurrence. Frequency of marijuana use also had no association with severity of tinnitus or how often tinnitus occurred. Similarly, the amount of marijuana used was not associated with severity or frequency of tinnitus occurrence. The authors further noted that tinnitus was not associated with use of other drugs, including alcohol, cocaine, heroin, or methamphetamines.

The researchers also conducted a multivariate analysis, which is when the relationship between one condition and multiple others is analyzed (prior analysis was univariate — relating one piece of data to one other piece of data). This analysis continued to show a relationship between tinnitus and marijuana use, but many of the other associations indicated during univariate analysis no longer showed a strong correlation with tinnitus. These included recreational noise exposure, age, smoking, cardiovascular disease, hypertension, aspirin use, and diabetes.

Other factors that were associated with tinnitus and marijuana use after multivariate analysis included hearing loss, history of work noise exposure, depression, and anxiety. This means that these factors occurred more frequently in subjects with tinnitus than in the general population of the survey.

The nature of the association between tinnitus and these conditions cannot be discerned from these data. Instead, results indicate only that these conditions occurred more frequently in subjects with tinnitus than they did within the general population. For instance, the association between having tinnitus and using marijuana does not imply which caused the other — or even whether there is a cause-effect relationship between the two traits. It may be possible that they are each related to a separate influence. Further research is necessary to establish any cause-effect relationship that may exist. However, the presence of a significant association between tinnitus and marijuana does indicate the need for additional research into benefits or risks that may occur with use of the drug.

Gender Differences in Tinnitus Treatment Outcomes

Summary by John A. Coverstone, AuD

A group of researchers from the University of Antwerp (Belgium) recently looked at whether women and men respond differently to tinnitus treatment.1 They did this by analyzing outcomes for an array of tinnitus treatment methods performed at the university hospital and comparing outcomes for men and women.

The university hospital uses a range of treatment options for tinnitus, including those used in this study: tinnitus retraining therapy with cognitive behavioral therapy (TRT+CBT); tinnitus retraining therapy with eye movement desensitization and reprocessing therapy (TRT+EMDR); physical therapy for those having problems with the neck or jaw; and high-definition transcranial direct current stimulation, or electrical stimulation of the brain. EMDR therapy has not been commonly discussed in this publication. It involves a patient being presented with emotionally charged memories in brief doses while they simultaneously focus on an external stimulus. The goal is to lessen negative responses and decrease distress caused by negative memories, experiences, or stimuli.

The tinnitus treatment study included 316 patients. The Tinnitus Functional Index (TFI) was used as the primary measure of tinnitus severity and tinnitus improvement post-treatment. A 13-point reduction in overall TFI score was considered to be meaningful, based on prior research. Each patient completed the TFI, along with any other questionnaires that were relevant to their condition, before and after treatment, and again three months after treatment.

The authors found that gender differences in TFI score varied across different treatments. For treatments the authors called “orofacial physiotherapy,” women benefited more than men. This appears to align with previous data showing that temporomandibular joint (TMJ) disorders were twice as prevalent in women than in men.2 This effect may therefore reflect greater incidence of the condition rather than more effective treatment.

High-definition transcranial direct current stimulation (HD-tDCS) was used to target an area of the brain called the dorsolateral prefrontal cortex. This area is associated with gating of sensory stimuli — in other words, it decides which stimuli we see and hear. One theory of tinnitus is that the neural pathways of the dorsolateral prefrontal cortex are damaged and therefore sounds that would normally be blocked are allowed to enter the auditory cortex and be perceived. When analyzing data from HD-tDCS, there was a greater benefit to women than to men. The authors also noted a prior study that also showed that tDCS is more effective in women.3

Conversely, males in this study benefited more from TRT+CBT than did females. There is no expected gender difference in the outcomes of psychotherapy and so this finding is intriguing. Treatment provided using TRT+EMDR yielded no significant differences in outcomes for men and women. It should be noted that significant improvement in TFI scores were found in both men and women using both these treatment methods.

Although the population was somewhat small for each treatment type, gender effects were noted in most cases. More research would need to be performed with a larger population, but these results do indicate that men and women respond differently to different types of treatment. It cannot be stated definitively that men or women are helped more by a certain treatment type, because it may be that one gender responds more quickly while the other needs more time to experience effective treatment. Of course, choosing an appropriate treatment modality is also driven by other factors, such as type and severity of tinnitus and presence of an underlying psychological disorder. Nonetheless, in the future the gender of the patient may play a role in determining the most effective or most efficient treatment for tinnitus.

Moving Online With Zoom for Tinnitus Support

By Trudy Jacobson

In 1965, AT&T’s Bell Telephone System advertised its long-distance service: “It’s the next best thing to being there.”

Now, 55 years later, little did we know how important that advertising slogan would be for us during the coronavirus pandemic. For those of us who are living with tinnitus, it’s especially vital to attend support groups with other people who can understand the challenges we face every day.

Even with social distancing, most if not all tinnitus support groups have not been able to meet in person because of concerns about the risk of transmitting the virus. Nonetheless, we need the social interaction and support that these groups provide. Then along came Zoom, a wonderful virtual platform that allows us to be together from the comfort and safety of our own homes.

Since the pandemic began, I’ve joined three virtual tinnitus support groups, and they are great! I feel that we can indeed get the closeness we need in a safe way. True, you can’t hug people, but virtual hugs are almost as good.

There are so many pluses to this method that I’m hoping virtual meetings will continue even after the danger of meeting in person subsides. The most obvious advantage, of course, is not having to drive somewhere, find a parking spot, then drive home; that’s not only saved time and less wear and tear on our cars but also better for our environment. Let’s hope the air remains clean as we navigate our new normal.

Another reason I hope virtual tinnitus support groups will endure is accessibility. You might not find a support group in your city or even have a tinnitus expert nearby. In my city, Tucson, Arizona, there was no such expert and no support group, so I started one last spring. We had our first group meeting in person, and right after that, the pandemic hit. We have switched to virtual meetings now.

Better yet, meeting virtually lets you join a group anywhere in the world. I have been in a group where most of us were in the United States and one person was in Mexico and another in Australia. The Australian was joining the meeting at 6 p.m. Arizona time, which was 10 a.m. his time the next day!

Another advantage is being able to participate even if you’re ill. Since we know that Covid-19 (as well as the common cold and flu) is contagious even before a person has obvious symptoms, no one wants to risk infecting or being infected through an optional gathering, no matter how important it might be.

Probably my favorite feature so far, though, is the ability to see everyone’s face at once (on grid screen). If you’re in a meeting, say, around a big table, you can only really look at one person at a time. With Zoom, you can see all the participants. I love when someone makes a statement, and all the heads are nodding in agreement at the same time! And to top it off, the quality of sound and visuals are perfect. It’s amazing if you think about it.

Another plus is the ability to record the audio so nobody has to take notes. Most hosts of meetings upload the audio file to their website or Facebook page after the meeting. Also, people who prefer to remain silent during the meeting can use the chat function to ask questions and make comments.

If you would like to join our Tucson virtual group, we meet via Zoom the fourth Monday of the month from 1 to 2 p.m., MST. We might add an evening meeting at a later date. Please email me at trudyj@cox.net or call/text me at (520) 982-7813. No matter where you live in the world, we will welcome you and would love to hear your story!
How Can We Tame Tinnitus in Tough Times?

10 TIPS TO HELP MANAGE TINNITUS

By Julian Cowan Hill, MA

As the coronavirus spread across the world, our lives were engulfed in fear of sickness, death, and unprecedented massive economic and social disruption. For weeks, most of us were trapped at home, longing for this to be over. Clearly, this was not going to be easy for people with tinnitus, a condition that’s often influenced by stress, which triggers a fight-or-flight response. Fearful thinking and feeling trapped are often the main drivers that keep the tinnitus alarm bells ringing.

In 1990, Pawel Jastreboff, PhD, a professor at Emory University, shared his neurophysiological model of tinnitus, which showed the dramatic changes in our response to audio cues when we feel threatened or trapped. Since then, we have understood that our hearing is inextricably linked to the fight-or-flight response.

If there’s a lion out there, hearing the snap of a twig behind us may save us. In seconds, adrenaline turns our ears into highly attuned antennae that listen so acutely that, if we stay in this heightened state for long enough, we end up listening to sounds inside our head that normally our brain ignores. Impulses along the auditory pathways can jangle into awareness, and faint sounds of ear pressure popping or a distant heart pulse can now be heard all too clearly.

For the alarm bells to stop ringing, we need to come out of fight-or-flight and return to a sense of safety. Normally, craniosacral therapy or other hands-on body work can help ease us back into a more peaceful and grounded state. The more this happens, the more oversensitive hearing resets itself and reverts back to peacetime mode. When we feel safe again, our ears ignore irrelevant noise inside and around us and only latch on to sounds that matter.

When we come out of fight-or-flight, we can read a book while ignoring sounds around us, we can fall asleep in front of a noisy TV, and we can focus on one-on-one conversations in a noisy pub and ignore the hubbub in the background. Peacetime ears are very good at filtering out all the irrelevant stuff. We are not designed to hear the buzz of our brains.

With this in mind, how can we tame tinnitus during tough times? The next page has 10 tips to help you manage tinnitus during the coronavirus pandemic or during other stressful times.

Julian Cowan Hill has a master’s degree in Core Process Psychotherapy and is a registered craniosacral therapist. He had severe tinnitus for 20 years before overcoming it and going on to help others improve their symptoms. In two decades of clinical practice as a psychotherapist, craniosacral therapist, and tinnitus consultant, he has consolidated techniques, approaches, and practices that help people cope with tinnitus distress and remain on track to enjoy life. His Quieten app is based on those many years of learning and experiences. For more information, see https://www.quietenapp.com/. He also has published several books on managing tinnitus, which are available on Amazon.
The first thing that helps is learning to self-soothe and consciously bringing your nervous system out of fight-or-flight mode. Gentle yoga or tai chi can help reduce the levels of activation and alertness. An hour a day can tip the balance significantly in your favor and gives you a healthy distraction from the ringing or other tinnitus sounds that you might hear.

Instead of a lion, we now all face the invisible predator called Covid-19 and expose our ears to threatening news bulletins that put us directly in touch with traumatic information. This needs to be limited as much as possible. Ten minutes of news in the morning is more than enough to keep us abreast of what’s important. Then we can recover, settle, and look after ourselves for the rest of the day.

Please stop exposing yourself to stressful information.

Just 20 minutes of meditation or yoga can prevent us from being hijacked by anxious thinking and can open up a whole new way of being. Feeling trapped inside a noisy head can be overwhelming. Now is the time to learn to shift the focus out of your head and into the body. This very real alternative helps pull our attention away from the ringing and negative thinking patterns, and also settles the nervous system.

You need to take better care and be kind to yourself to help your nervous system settle. Don’t give yourself a hard time or demand too much of yourself just now. With heightened stress levels, it is important to pace yourself. If in doubt, do things that relax you, get out, go for a walk, have a bath, take a cold shower.

Many people with tinnitus feel very afraid and threatened when they first develop symptoms. This is often compounded when they go online and read no end of horror stories that further trigger the alarm bells. Please avoid negative information about tinnitus like the plague.
Stay clear of moaning and groaning groups who are stuck in negativity and promote the “No Cure Model.” Please stop talking about how bad your tinnitus is and reinforcing this with others. If you come across a health practitioner who tells you there is nothing you can do about tinnitus, leave immediately. They cannot help you. Don’t fall into the trap of practicing the No Cure Model.

Aim for well-being. You need to move into a positive mindset. Learn from people who have gotten better. Listen to positive tinnitus stories. Destress and settle your nervous system, and you will feel better, manage better, and the sound will pipe down. Do the things you love doing, activities that relax you and make you feel connected to others. The brain’s ability to refresh itself and learn new patterns, known as neuroplasticity, works well when we move toward positive experiences that help us feel safe and relaxed.

Use this time to learn techniques and strategies to help calm the mind, relax the body, and focus your attention, including simple practices such as clenching and relaxing, walking meditation, tapping, running commentary technique, and slow movement that can settle your mind and body with practice. Use this time to build your toolbox and skills that help you let go of tinnitus and stay present instead of being hijacked by catastrophic thinking. Find tools that work for you and practice them.

Develop understanding and learn that tinnitus can be a temporary stress-related symptom. When we have a good understanding of how this symptom works, it feels much less threatening and the way forward starts to make sense. Treat tinnitus as a healthometer and learn from its feedback. When it pipes up, consider what may have caused this. When it backs off, learn from this useful feedback and try implementing lifestyle changes, approaches, and practices that keep you going in this direction.

As the world opens up after lockdown, you will probably know how to be safe interacting with other people regarding the virus. My advice is not to accelerate too quickly into a fast-paced life again. Instead, keep a firm foot in self-care, drawing on such tools as yoga or tai chi and self-soothing.

Eat a healthy diet and avoid ingesting too much salt, sugar, and stimulants such as coffee, tea, and alcohol. In moderation they are fine, but too much can be activating.
How to Decide If Personal Sound Amplification Products Are Right for You

By Danielle J. Frank, AuD, and Emily Francisco, AuD

Personal sound amplification products (PSAPs) are defined by the U.S. Food and Drug Administration (FDA) as wearable electronic amplification devices that are marketed to consumers with normal hearing to amplify environmental sounds during recreational activities.¹ These devices are available for purchase online or in stores and do not require consultation with a hearing care professional. PSAPs vary greatly in price, ease of use, and technological capabilities, providing a variety of options for access to and success with these devices. Some devices also require use of additional technology, such as a smartphone or tablet.

Individuals with normal hearing who experience difficulty hearing in situations with background noise may benefit from the noise reduction capabilities and directional microphones found in some PSAPs. Additionally, these devices have been shown to provide benefit to individuals outside of their marketed population — explicitly to adults with hearing loss. PSAPs differ from hearing aids in several ways (see sidebar) but have been shown to have enough amplification to provide audibility to individuals with up to a moderate degree of hearing loss.² Many people with hearing loss are not ready to pursue traditional hearing aids for a variety of reasons, even when they may be a good candidate. Individuals who want a device for occasional use, who cannot justify the cost of hearing aids, and who have other personal reasons for bypassing hearing aids may look for alternative options to improve their communication. PSAPs can serve as a stepping stone for people who need hearing help but who are not yet ready for hearing aids.

Traditionally, audiologists have been skeptical of PSAPs, concerned that they are low-quality amplifiers that do not provide benefit for patients and are not labeled by the FDA for use to treat hearing loss. For the past year, the Department of Audiology at Massachusetts Eye and Ear (MEE) has been dispensing PSAPs in the clinic and learning that these concerns are not always borne out. The process has revealed that some PSAPs can provide a subset of patients with access to improved communication or tinnitus management, which allows them to serve a wider range of people with a broad spectrum of needs. PSAPs can also benefit audiologists by providing another option they can present to their patients. Counseling patients about all of the options available to them shows patients that an audiologist is a healthcare provider who recommends solutions for improved communication, not simply someone who sells a device.

Evaluating and Selecting PSAPs

A wide variety of PSAPs are on the market, with a range of available features. For individuals looking to purchase a PSAP, it may seem overwhelming to sort through these options to find a device. Researching devices on the internet or asking for recommendations from friends or professionals can initially help narrow the search; some audiologists may be able to provide information and guidance that will streamline the selection process. It is important to research all aspects of the device and confirm that the device features will help meet the communication needs and goals of the individual. For example, if a person is looking to increase volume solely for one-on-one conversation, the features they may find beneficial could be different from those of a device for a person looking for better communication in a variety of environments with streaming capabilities for music and tinnitus management. If a device is not providing benefit, customers have the ability to return the device during the manufacturer’s trial period.

For audiologists looking to dispense PSAPs in the clinic, it is important to
thoroughly evaluate the devices to determine which PSAPs will best serve their patient population. Knowing your population helps you choose devices that suit your patients in terms of price, ease of use, and adjustment ability. Once audiologists have identified prospective devices, they can contact PSAP manufacturers to either obtain a demo device or purchase a device for evaluation. Once received, audiologists should create their own evaluation protocol, which may include electroacoustic evaluation to assess maximum output and distortion, along with test box or real ear measures to assess programmability. The PSAPs that do not live up to expectations can be returned during the manufacturer’s trial period. Devices that show promise can be kept and used for demonstration with interested patients.

**PSAP Capabilities and Tinnitus**

Different capabilities integrated into these devices will appeal to different individuals with specific needs. The features available in some PSAPs may be beneficial for people who experience tinnitus, an off-label use according to the FDA. One such feature of PSAPs is the ability to stream sound from other devices over a Bluetooth connection, meaning audio from smartphones, computers, tablets, and other devices with a Bluetooth connection can stream wirelessly to the PSAP. For tinnitus patients, streaming tinnitus maskers or sound therapy from a preferred application is possible as a part of their tinnitus management plan.

Many PSAPs also allow the user to manipulate the frequency, or pitch, response of the device. Users have the ability to increase overall volume and/or specifically manipulate the low, mid, or high frequencies. For individuals with hearing loss in addition to tinnitus, turning up the volume in the pitch range where they have hearing loss may help them hear better and may also reduce the perception of their tinnitus.

**PSAPs and the Future of Hearing Health**

PSAPs have been around for many years, but their technology and accessibility have improved in recent years. It is also relatively new for audiologists to consider offering these devices to patients. As professionals continue to evaluate the capability of these devices, their usefulness for people with different types of hearing problems will continue to be uncovered. For individuals with tinnitus, PSAPs can provide amplification of environmental sounds and can stream masking sounds from devices with Bluetooth capability, which may provide benefit by reducing perception of the tinnitus. Whether you’re working with a professional or navigating this process on your own, consider PSAPs a viable and affordable option for tinnitus management.

Emily Francisco, AuD (left), is a clinical audiologist at Mass. Eye and Ear. She completed her doctorate in Audiology at Northwestern University in Evanston, IL. Danielle Frank, AuD (right), is also a clinical audiologist at Mass. Eye and Ear. She completed her doctorate in Audiology at Rush University in Chicago, IL. Both Emily and Danielle are involved with evaluating and working with PSAPs at Mass. Eye and Ear and were a part of the introduction to dispensing these devices at their clinic.


### PSAPs and Hearing Aids: What’s the Difference?

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<thead>
<tr>
<th><strong>PSAPs</strong></th>
<th><strong>Hearing Aids</strong></th>
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<tr>
<td>Electronic devices that amplify sound</td>
<td>Durable medical equipment intended to compensate for impaired hearing</td>
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<tr>
<td>Can be purchased over the counter without assistance from a professional</td>
<td>Purchased from a licensed professional (e.g., an audiologist)</td>
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<tr>
<td>Meant for occasional use; battery life typically lasts for hours</td>
<td>Meant for full-time use; battery life typically lasts for days</td>
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<tr>
<td>One size fits most, with some companies providing different sized ear pieces</td>
<td>Personalized fit for both physical and acoustic fit</td>
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<tr>
<td>Range in price, but are less expensive than hearing aids</td>
<td>Range in price, but are more expensive than PSAPs</td>
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<tr>
<td>Offer a variety of capabilities, including Bluetooth connectivity and rechargeability</td>
<td>Offer a variety of capabilities, including Bluetooth connectivity and rechargeability</td>
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Hearing Options Beyond Hearing Aids

By David Swan

If you’ve lived with tinnitus or hearing problems for long, you’ve probably tried a number of things to remedy the situation. I recently turned to something that I had never imagined as an option: a personal sound amplification product, or PSAP.

I suddenly found myself in the market for a PSAP when both my hearing aids started having trouble about the same time the coronavirus was spreading across the United States. The hearing aid for my right ear had almost no function, making conversation a struggle, while the control button for the left-ear hearing aid got stuck, leaving me unable to lower the volume. With the shutdown causing some businesses to close their doors permanently, I was afraid to send them in for repair, fearing I’d never get them back. Since they were shy of three years old, my insurance company declined to pay for replacements.

In the midst of this, my tinnitus had spiked and everything sounded harsh and distorted. Prior to the shutdown causing some businesses to close their doors permanently, I was afraid to send them in for repair, fearing I’d never get them back. Since they were shy of three years old, my insurance company declined to pay for replacements.

In the midst of this, my tinnitus had spiked and everything sounded harsh and distorted. Prior to the shutdown, I had foolishly gone to a movie with blaring sound without earplugs. This sound was different from the high-pitched tones I’d been hearing and had managed pretty well since developing tinnitus about 15 years ago.

Yes, I knew about PSAPs but had never considered any over-the-counter devices because I worried they might do more harm than good. My wife, however, was tired of me saying “What?” every few minutes, and the spike was driving me crazy. When my audiologist told me it wouldn’t hurt to try a PSAP, I turned to the internet to research my options.

There’s a vast number of choices, with prices ranging from less than $20 to several hundred (and unless the website says otherwise, they’re usually sold individually, not in pairs). Most are designed for people with mild to moderate hearing loss; however, you will find some aimed at people with severe hearing loss. Some reviewers swore their PSAPs worked better than expensive, professionally fitted hearing aids. Other reviewers were emphatic that they did not, writing “DO NOT BUY. NOTHING BUT TROUBLE.”

I settled on a Walker’s HD Elite, which fell in the middle price range and had mostly five-star and four-star ratings on Amazon. It has a mic, battery compartment, and simple volume control, along with a plastic sound tube and a set of domes and foam earpieces (similar to earplugs). The product manual says it boosts high frequencies with 50 decibels of power, while protecting the user’s hearing from loud noises “such as muzzle blasts.”

Compared to what I’m used to, these are low-tech. But they work for me. Though they’re not calibrated to my specific hearing loss, they boost the frequencies that need it most, which makes a big difference in my quality of life. Right away, watching TV and talking to my wife became normal again. (She says the PSAP saved our marriage.)

My tinnitus is better too. The distortion caused by exposure to loud sound in the movie theater faded, allowing me to listen to music without cringing. To be clear, I’m not suggesting the PSAP cured that, but I believe it facilitated the process by providing the amplification that my failed hearing aids could not. My only complaint is that the domes and earpieces don’t fit my small ear canals well.

Though PSAPs are not my long-term solution, they have filled a need at a difficult time without damaging my hearing as I had feared they could. Until I can be fitted for a new set of hearing aids, I’ll keep using them. If you think PSAPs might be right for you, talk to your doctor and/or audiologist before buying something, do your homework to understand what they can and can’t do, and be sure they won’t harm your hearing.

Dave Swan is a writer, editor, blogger, and former broadcast journalist. He experienced mild, occasional tinnitus for a number of years before it became constant in 2006 for reasons that are unclear. He and his wife live in Atlanta, where he’s a member of the Atlanta Tinnitus Support Group.
Exploring Insomnia in People With Tinnitus

Summary by John A. Coverstone, AuD

When tinnitus is bothersome, it can often interfere with sleep. At the same time, providers specializing in tinnitus recognize that getting sleep is an important part of any treatment for tinnitus. When we don’t sleep well, our ability to control reactions to stimuli is impaired, as is our tolerance for unwanted stimuli. Lack of sleep can create a vicious cycle in which tinnitus prevents good sleep and lack of sleep worsens tinnitus symptoms. Researchers in the United Kingdom performed a retrospective study to examine aspects of insomnia in patients with tinnitus and hyperacusis. Data were gathered from 444 patients with tinnitus or hyperacusis seen at a specialist center in the U.K. National Health Service from 2013 to 2016. Patients were selected if they completed audiological examination and questionnaires for insomnia, tinnitus and/or hyperacusis, and anxiety and depression.

Analysis indicated that 70 percent of patients had some form of insomnia: 30 percent had mild insomnia, 28 percent had moderate insomnia, and 18 percent had severe insomnia. Analysis of data indicated a significant association of tinnitus and insomnia. Insomnia was also associated with anxiety and depression. Patients having tinnitus and hyperacusis tended to have more severe sleep problems than those with tinnitus alone. This is consistent with prior studies reporting higher rates of insomnia among people with sound tolerance problems. However, further analysis of this relationship indicated that hyperacusis itself is a poor predictor of insomnia.

In further analysis, the data showed correlations between insomnia and tinnitus annoyance and between insomnia and tinnitus handicap, as well as for anxiety and depression. Tinnitus loudness was not a good predictor of sleep problems. This may be due to the subjective loudness of tinnitus being a smaller factor in its effects on people than is tinnitus annoyance, anxiety, or depression. The effect of tinnitus on the individual’s life was also not a good predictor of insomnia, nor was hearing acuity, age, or gender. More research is needed to further explore some of these relationships. Defining the aspects of tinnitus that may contribute to insomnia can only help clinicians develop better plans of treatment to help patients with bothersome tinnitus.

Reference
People with tinnitus at every stage in their journey, from the first few days to many years later, can benefit from membership in a support group. Every tinnitus support group operates somewhat differently; but they all share a passion for providing meaningful discussion and a caring environment where one can be understood through shared experience. Below is a list of groups and meeting dates, current at time of print. To reconfirm dates and times, please email/call the point-of-contact person listed.

### Support Groups Holding Online Zoom Meetings

**Arizona**

**Tucson Tinnitus Support Group**
Meeting virtually until further notice
Contact: Trudy Jacobson
T: 520–982–7813
E: trudyj@cox.net
4th Monday of the month, 1–2 pm.

**California**

**Los Angeles/Orange County Tinnitus Support Group**
Meeting virtually until further notice
Contact: Barry Goldberg
E: bargold06@yahoo.com
Sept. 19

**San Diego Tinnitus and Hyperacusis Support Group**
Meeting virtually until further notice
Contact: Michael J. Fischer, Loretta Marsh, Dave Phaneuf, Tom Sutton
E: michaeljfisher@hotmail.com
E: loretta.marsh@hotmail.com,
T: 858–484–9267
E: djphaneuf@yahoo.com
E: tomsutton63@gmail.com
1st Wednesday of the month, 6–7:30 pm.

**The Palo Alto Tinnitus Support Group at Avenidas**
Meeting virtually until further notice
Contact: Ken Adler, Amy Nelson, AuD,
Brandon Cyrus, AuD
E: karmtac@aol.com
E: Amy.Nelson@kp.org
E: brandon@landmarkhearing.com
3rd Thursday of the month, 6:30–8:30 pm.

**Colorado**

**Denver Tinnitus Support Group**
Meeting virtually until further notice
Contact: Rich Marr
T: 303–875–5762
E: r.marr@comcast.net
2nd Monday of the month, 7–8:30 pm.

**Maine/New Hampshire/Vermont**

**Maine/NH/VT Virtual Tinnitus & Hyperacusis Support Group**
Contact: Mark Rossnagel
E: mark.rossnagel@gmail.com
Meeting dates and times TBD

**Maryland**

**University of Maryland Tinnitus and Hyperacusis Support Group**
Meeting virtually until further notice
Contact: Christina Shields, AuD
T: 301–405–5562
E: shields3@umd.edu
FB: https://www.facebook.com/UMDHearingSpeechClinic
Meeting dates and times TBD

**Missouri**

**St. Louis Tinnitus Support Group**
Meeting virtually until further notice
Contact: Tim Busche
T: 636–734–4936
E: tbusche@stltinnitus.org.
Meeting dates and time: Aug. 5, Oct. 7, Dec. 2, 7–9 pm

**Texas**

**Dallas/Ft. Worth Tinnitus Support Group**
Meeting virtually until further notice
Contact: John Ogrizovich
E: dfwtsg@yahoo.com
Meeting Saturdays, every four to eight weeks, from 10 am.

**Washington**

**Seattle Tinnitus Support Group**
Meeting virtually until further notice
Contact: Keith Field
T: 206–783–7105
E: keith_r_field@outlook.com
3rd Thursday of the month from 7:30–8:45 pm.

If you’re interested in forming a group, please contact Kevin Willman at k.willmann@ata.org.

If there isn’t a group in your area, the ATA has an extensive network of volunteers who provide email and telephone support and educational information. To connect with a volunteer in your time zone, see https://www.ata.org/managing-your-tinnitus/support-network/telephoneemail-support-listing.
Due to the coronavirus, it is critical to contact support groups directly to verify meeting dates and times, and personal protection requirements. Information on www.ata.org is provided by support group leaders.

### California

**San Francisco Tinnitus Support/Education Group**

Hearing and Speech Center of Northern CA
2nd Floor Conference Room
1234 Divisadero St.
San Francisco, CA 94115
Contact: Tracy Peck Holcomb
T: 415–921–7658
E: tracy@hearingspeech.org
Meeting dates and times TBD.

### Colorado

**Denver Tinnitus Support Group**

Lutheran Medical Center
2nd Floor Learning Center, Classroom #1
8300 West 38th
Arvada, CO 80033
Contact: Rich Marr
T: 303–875–5762
E: r.marr@comcast.net
Meeting dates and times TBD.

### Florida

**Clermont Tinnitus Support Group**

Citrus Hearing Clinic
835 7th Street Suite 2
Clermont, FL 34711
Contact: Laura Bradley Pratesi, AuD
T: 352–989–5123
E: lisanne@citrushearing.com
Meeting dates and times TBD.

**Sarasota Tinnitus Support Group**

Silverstein Institute
1901 Floyd St.
Sarasota, FL 34239
Contact: Carmen Trotta, Tom Terrenzi
T: 941-993-7616, 941-462-1311
E: sarasota.ata@gmail.com
3rd Friday of the month from 2:00–4:00 pm.

### Georgia

**Atlanta Tinnitus Support Group**

Dekalb County Public Library
Dunwoody Branch, Meeting Room
5339 Chamblee Dunwoody Rd.
Dunwoody, GA 30338
Contact: Erica Caplan
E: elcatt@aol.com
Email support provided until in-person meetings resume.

### Illinois

**Chicago Suburban Tinnitus Support Group**

Contact: Margie B.
E: maggie318@yahoo.com
Meeting dates and times TBD.

### Maryland

**DC & MD Tinnitus Support Group**

Potomac Audiology
11300 Rockville Pike, Suite 105
Rockville, MD 20852
Contact: David Treworgy, Gerry Baill, Ann Ramsey
E: david_treworgy@yahoo.com
E: gsbail@yahoo.com
E: TinnitusDC@gmail.com
Meeting dates and times TBD.

### Massachusetts

**Boston Tinnitus Support Group**

Athan’s Bakery
407 Washington St.
Brighton, MA 02135
Contact: Kevin Plovanich
E: JKPMA@aol.com
Meeting dates and times TBD.

### Michigan

**Holland Tinnitus Support Group**

399 E 32nd St.
Holland, MI 49423
T: 616–392–2222
E: info@holaud.com
Email and chat support provided until in-person meeting resume.

### New Jersey

**South Jersey Tinnitus Support Group**

Advanced ENT/HearMD
1020 North Kings Highway, Ste. 201
Cherry Hill, NJ 08034
Contact: Beth Savitch, Erin Lustik
E: tsg@advancedent.com
Meeting dates and times TBD.

### New York

**Bronx Tinnitus Support Group**

Mediator Church
Conference Room
260 W. 231st St.
Bronx, NY 10463
Contact: Dr. Karie Nabinet
T: 917–797–9065 or 718–410–2301
E: kkwn12u@aol.com
1st Thursday of the month from 6:00 pm.

**The Long Island Tinnitus Group**

Long Island Jewish Hospital
900 Franklin Ave. (Meet in the lobby before going down to conference room.)
Valley Stream, NY 11580
Contact: Anthony Mennella
T: 516–379–2534
E: aem830@verizon.net
Meeting dates and times TBD.

### North Carolina

**Raleigh Tinnitus Support Group**

Raleigh Hearing and Tinnitus Center
10320 Durant Road, Suite 107
Raleigh, NC 27614
Contact: Saranne Barker, AuD, Sheri Mello, AuD
T: 919–790–8889
E: info@rhatc.com
Meeting dates and times TBD.

### Oregon

**VA Portland Health Care System Tinnitus Education Group**

National Center for Rehabilitative Auditory Research
3710 SW US Veterans Hosp. Rd.
Portland, OR 97239
Contact: Bryan Shaw
E: Bryan.Shaw2@va.gov
Meeting dates and times TBD.
Other Support Groups

**Pennsylvania**

**Lehigh Valley Tinnitus Support Group**
Meeting location TBD
Contact: Ed Kozelnicky
T: 610–797–7251 (H), 610–739–6675 (C)
Meeting dates and times TBD.

**Texas**

**Houston Tinnitus Support Group**
Business Center, Village at West University Apartments
5151 Edloe St.
Houston, TX 77005
Contact: Vinaya Manchaiah
T: 409–466–0427
E: houstontinnitus@gmail.com
Meeting dates and times TBD.

**San Antonio Tinnitus & Hyperacusis Support Group**
Contact: Matthew Randal
Email: atasg.satx@gmail.com
Meeting dates and times TBD.

**Virginia**

**Northern Virginia Tinnitus Support Group**
Northern Virginia Resource Center for Deaf & Hard of Hearing Persons (NVRC)
3951 Pender Drive, Ste. 130
Fairfax, VA 22030
Contact: Elaine Wolfson, Marian Patey
E: erwolfson@comcast.net
E: pateywomyn@aol.com
Meeting dates and times TBD.

**Wisconsin**

**Madison Tinnitus Support Group**
Madison Masonic Center
85 S Stoughton Rd.
Madison, WI 53714
Contact: Deb Holmen
T: 608 219 0277
E: dholmenhearu@gmail.com
Meeting dates and times TBD.

Each support group referenced here is independently operated and led by volunteers who wish to provide education and support to the tinnitus community. The American Tinnitus Association (ATA) does not sponsor nor endorse these activities and expressly disclaims any responsibility for the conduct of any independent support group or the information they may provide. ATA is not a healthcare provider and you should consult with a primary care physician or hearing healthcare professional for qualified medical advice on tinnitus and related disorders.

Some groups do not or cannot schedule meetings far in advance to allow for flexibility in planning. We post support group meeting information on our online events calendar at ATA.org, which is provided to us by support group leaders. The above information was provided to ATA staff at the time the magazine went to print; therefore, please confirm meeting details with the contact person prior to a meeting or reference our website at: https://www.ata.org/news/events

This is a partial listing of support groups and scheduled meetings. A complete list can be found at https://www.ata.org/managing-your-tinnitus/support-network/support-group-listing
New groups are added on a regular basis so check the website periodically for updates.

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**Spotlight on Patient Providers**

**Professional Members**
Listing current as July 14, 2020

When making an appointment, please mention that you learned of the provider from the ATA, thereby ensuring that providers understand the importance of being a part of the ATA’s tinnitus patient-provider network.

**COLOR KEY**

- Purple: Audiology
- Green: Medical practitioner
- Blue: Hearing aid dispenser
- Orange: Therapist
- Pink: Complementary/Alternative Medicine practitioner
- Navy: Other

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**United States**

**Alabama**

**Susan Sheehy, AuD**
Alabama Hearing Associates
Madison, AL

**Alaska**

**Emily McMahan, AuD**
Alaska Hearing & Tinnitus Center
Anchorage, AK

**Arizona**

**Lynn Callaway, BC-HIS**
Affordable Hearing Solutions
Green Valley, AZ

**Judy Huch, AuD**
Oro Valley Audiology Inc.
Oro Valley, AZ

**Jonathan Ramirez-Lira, AuD**
Sound Relief Hearing Center
Scottsdale, AZ

**Arkansas**

**Kelley Linton, AuD**
Center for Hearing, Ltd
Fort Smith, AR

**California**

**Kasra Abolhosseini, AuD**
Tustin Hearing Center
Tustin, CA

**Melissa Alexander, AuD**
Alexander Audiology
Santa Monica, CA

**Randall Bartlett, MA**
Tinnitus & Audiology Center of Southern California, Inc.
Valencia, CA

**Neal Sorensen, BS**
Moore Audiology
Sun City, AZ

**Thea Wickey, AuD**
Sound Relief Hearing Center
Scottsdale, AZ

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HEALTHCARE PROVIDERS

Troy Cascia, AuD
UCSF Health
San Francisco, CA

Shahrzad Cohen, AuD
Hearing Loss Solutions
Sherman Oaks, CA

Arthur Corpus, PA
Sharp Rees-Stealy Medical Group Inc.
Chula Vista, CA

Jean M. Deiss, AuD
VA Northern California Health Care System
Martinez, CA

David DeKriek, AuD
Fidelity Hearing Center
Cerritos, CA

Jerilyn Dutton, AuD
Salient Sounds Audiology
La Jolla, CA

Gregory Frazer, AuD
Pacific Hearing & Balance Center Inc.
Los Angeles, CA

Jennifer J. Gans, PsyD
Mindful Tinnitus Relief
San Francisco, CA

Amit Gosalia, AuD
West Valley Hearing Center
Woodland Hills, CA

Tracy Peck Holcomb, AuD
Hearing and Speech Center of Northern California
San Francisco, CA

Kent Holtorf, MD (Integrative)
Holtorf Medical Group
El Segundo, CA

Malvina Levy, AuD
Hearing and Speech Center of Northern California
San Francisco, CA

Sara Mattson, AuD
Rancho Santa Fe Audiology
Rancho Santa Fe, CA

Amy Nelson, AuD
Kaiser Permanente
Santa Clara, CA

Mami Novik, AuD
Silicon Valley Hearing Inc
Los Gatos, CA

Charles Steven Peltz, MFT
Steven Peltz, MFT
San Francisco, CA

Bruce Piner, AuD
Hearing and Balance Center
Encino, CA

Jane Rosner, AuD
West Valley Hearing Center
Woodland Hills, CA

Mimi Salamat, PhD
Dr. Mimi’s Audiology Clinic
Walnut Creek, CA

William Stubbsman, MD
TMS Psychiatry
Los Angeles, CA

Christopher Sumer, NBC-HIS
Coastal Hearing Aid Center
Encintas, CA

Katarzyna Tarnowska, PhD
San Jose State University
San Jose, CA

Benjamin Thompson, AuD
Pure Tinnitus
Berkeley, CA

Brian Worden, MD (ENT)
Kaiser Permanente
Woodland Hills, CA

Lindsay Collins, AuD
Sound Relief Hearing Center
Centennial, CO

Kaela Fasman, AuD
Sound Relief Hearing Center
Golden, CO

Abigail McMahon, AuD
Sound Relief Hearing Center
Fort Collins, CO

Natalie Phillips, AuD
Advanced Otolaryngology & Audiology
Fort Collins, CO

Mandi Solat, AuD
Audiology Services & Hearing Aid Center
Lakewood, CO

Steven Lurie, PhD
Torrington, CT

Anne Carter, AuD
Pasadena Hearing Care
South Pasadena, CA

Maura Chippendale, AuD
Chippendale Audiology
Cape Coral, FL

Melissa Kipp Clark, AuD
Suncoast Hearing Services Plus
Bradenton, FL

Ali Danesh, PhD
Labyrinth Audiology
Boca Raton, FL

Brooke Davidson, AuD
Baptist ENT Specialists
Jacksonville Beach, FL

Ericka DeVore AuD
All About HearingLake Audiology & Hearing Aids
Longwood, FL

Wilson DuMomay, MD
Broward ENT Services
Fort Lauderdale, FL

Kelly J. Dyson, AuD
Suncoast Audiology, LLC
Largo, FL

Melodi B. Fehl, MS
ENT & Allergy Associates of Florida
Boca Raton, FL

Lisa Gascay, AuD
Rainbow River Hearing & Balance Inc.
Dunnellon, FL

Margaret Richards, AuD
The Hearing Center
Pensacola, FL

Sharon Rophie, AuD
Harbor Hearing PA
Palm Harbor, FL

Cindy Ann Simon, AuD
South Miami Audiology Consultants
South Miami, FL

Mindy Stejskal, MCD
The Hearing Center
Pensacola, FL

Anne Marie Taylor, AuD
ALPHA Audiology
Panama City Beach, FL

Susan E Terry, AuD
Broadwater Hearing Care
St. Petersburg, FL

Liz White, AuD
Harbor City Hearing Solutions
Melbourne, FL

Kayla Wilkins, AuD
Aspire Hearing and Balance
Lakeland, FL

Laura Barber, AuD
Augusta University Health-Audiology Associates
Augusta, GA

Nikki DeGeorge AuD
Fayette Hearing Clinic and Coweta Hearing Clinic
Peachtree City, GA

Brian K. Jones, Med
Greater Atlanta Hearing Inc.
Cumming, GA

Christin Brooke Means, AuD
North Georgia Audiology
Suwanee, GA

Otis Whitcomb, MA
Cobb Hearing Aid Services
Marietta, GA

Melissa Wikoff AuD
Peachtree Hearing
Marietta, GA

Christine Pickup, AuD
Mt. Harrison Audiology & Hearing Aids, LLC
Rupert, ID

Tosha Strickland, AuD
Strickland Ear Clinic
Meridian, ID

Nancy Congdon, AuD
The Hearing Care Clinic
Downers Grove, IL

Phillip Elbaum, LCSW
Deerfield, IL

Lori A. Halvorson, AuD
Lake Forest Hearing Professionals
Lake Forest, IL

JoAnn Harano, AuD
Loyola University Health System
Chicago, IL

Maria Morrison, AuD
Geneva Hearing Services
Geneva, IL

www.ATA.org

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### Healthcare Providers

**James H Peck, HIS**  
Life Hearing Health Centers  
Rockford, IL

**Jeanne Perkins, AuD**  
Audiologic Services  
Glen Elyn, IL

**Alyssa Seeman, AuD**  
Illinois State University  
Normal, IL

**Indiana**

**Laura L. Fragomeni, AuD**  
Reid Hearing Center  
Richmond, IN

**Erica Person, AuD**  
Flex Audiology  
Lawrenceburg, IN

**Iowa**

**Diana Kain, AuD**  
Heartland Hearing Center  
Hiawatha, IA

**Beki Kellogg, AuD**  
Hope Hearing & Tinnitus Center  
Hiawatha, IA

**Jill Nesham**  
Professional Hearing Solutions by Dr. Jill  
Cedar Rapids, IA

**Heather Thatcher, HIS**  
Hope Hearing & Tinnitus Center  
Hiawatha, IA

**Richard Tyler, PhD**  
University of Iowa, Dept. of Otolaryngology — Head & Neck Surgery  
Iowa City, IA

**Shelley Witt, MA**  
University of Iowa Hospitals & Clinics  
Iowa City, IA

**Kansas**

**Bryne Gonzales, AuD**  
NuSound Hearing & Tinnitus Center  
Topeka, KS

**Lauren Mann, AuD**  
University of Kansas Medical Center  
Kansans City, KS

**Michael Schneller, HIS**  
Focus Hearing  
Overland Park, KS

**Susan Smittkamp AuD**  
Associated Audiologists Inc.  
Shawnee Mission, KS

**Kentucky**

**Ann Rhoten, AuD**  
Kentucky Audiology & Tinnitus Services  
Lexington, KY

**Louisiana**

**Mary Miller, PhD**  
Premier Hearing and Balance  
Hammond, LA

**Mary Carter, AuD**  
University of Maryland Medical Center  
Baltimore, MD

**Christina Shields, AuD**  
University of Maryland College Park  
College Park, MD

**Massachusetts**

**Dierdre Anderson, AuD**  
Audiology Network Services  
Salisbury, MA

**Eugene Antonell, BC-HIS**  
Hear Better Now Tinnitus & Hearing Center  
N. Dartmouth, MA

**Nataliya Ayzenberg, AuD**  
Moon Hearing Services, LLC  
Woburn, MA

**Judith Bergeron BC-HIS**  
Beauport Hearing Care  
Gloucester, MA

**Joni Skinner Bullough, AuD**  
Hampshire Hearing & Speech  
Northampton, MA

**Theresa Cullen, AuD**  
Cape Cod Hearing Center  
Hyannis, MA

**Peter Harakas, PhD**  
CBT Associates, LLC  
Lexington, MA

**Robert Mario BC-HIS**  
Mario Hearing & Tinnitus Clinics  
Cambridge, MA

**Karen L. Wilber, AuD**  
Boston Childrens Hospital  
Boston, MA

**Michigan**

**Terese Alsum, AuD**  
Kaczmarski Hearing Services  
Wyoming, MI

**Stelios Dokianakis, AuD**  
Holland Doctors of Audiology  
Holland, MI

**MaryRose Hecksel, AuD**  
Audiology & Hearing Aid Center  
Lansing, MI

**Beckie Kaczmarski, AuD**  
Kaczmarski Hearing Services  
Wyoming, MI

**Angela Lederman, MS**  
Hear Now Audiology & Tinnitus Center  
Clinton Township, MI

**Shannon Radgens, DO**  
Red Cedar Ear Nose & Throat & Audiology  
Owosso, MI

**Michelle Rankin, AuD**  
Ascent Audiology & Hearing  
Chester, MI

**Michael Robinette, AuD**  
Michigan Ear Institute  
Farmington Hills, MI

**Karrie Slominski, AuD**  
Henry Ford Health System  
West Bloomfield, MI

**Benjamin Wightman, AuD**  
Sound Advice Audiology  
Livonia, MI

**Minnesota**

**John Ehlen**  
Hear Central  
Victoria, MN

**Jason Leyendecker, AuD**  
Audiology Concepts  
Edina, MN

**Laura Morrison, AuD**  
Stillwater Medical Group-Health Partners  
Stillwater, MN

**Dr. Thomas Tedeschi, AuD**  
Amplifon Americas  
Minneapolis, MN

**Missouri**

**Laura Flowers, AuD**  
Hearing and Balance Specialists of Kansas City  
Lee’s Summit, MO

**Linda Guhe, MSW**  
Mind Body Clinical Hypnosis  
St. Louis, MO

**Jay Piccirillo, MD**  
Washington University School of Medicine  
Saint Louis, MO

**Nevada**

**Robyn Lofton, BC-HIS**  
Hearing Associates of Las Vegas  
Las Vegas, NV

**Elana Walker, AuD**  
VA Southern Nevada Healthcare System  
Las Vegas, NV

**New Jersey**

**Catherine Ahrens Berke, BC-HIS**  
Ahrens Hearing Center  
Fair Lawn, NJ

**Granville Brady Jr., AuD**  
East Brunswick, NJ

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*Please note that the American Tinnitus Association does not verify providers’ certifications and expertise in tinnitus treatment. The list is meant expressly for informational purposes and should not be construed as the ATA’s endorsement of the providers listed. The ATA strongly advises anyone using the list to check practitioners’ websites and tinnitus services before scheduling appointments. Please note that the list includes hearing aid dispensers because hearing aids can be helpful to some people in the management of their tinnitus.*
<table>
<thead>
<tr>
<th>State</th>
<th>Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>Valerie Kriney, AuD</td>
<td>Northern Jersey ENT Associates, Glen Rock, NJ</td>
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<tr>
<td></td>
<td>Beth Savitch, MA</td>
<td>Advanced ENT/Hear MD, Voorhees, NJ</td>
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<td></td>
<td>Donna Szabo, AuD</td>
<td>Innovative Hearing Solutions, Westwood, NJ</td>
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<td></td>
<td>Nicole Ball, AuD</td>
<td>Hearing Evaluation Services of Buffalo, Inc</td>
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<td></td>
<td>Carol Bass, MS</td>
<td>All Ears Audiology Tinnitus &amp; Hyperacusis</td>
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<td></td>
<td>Collin Campbell</td>
<td>Campbell Acupuncture, New York, NY</td>
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<td></td>
<td>Alyssa Beaton, AuD</td>
<td>Hearing Evaluation Services of Buffalo, Inc</td>
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<td></td>
<td>Craig Kasper, AuD</td>
<td>New York Institute for Hearing and Balance</td>
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<td></td>
<td>Tracey Lynch, AuD</td>
<td>Island Better Hearing Inc</td>
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<td></td>
<td>Katherine Malettone, AuD</td>
<td>ENT &amp; Allergy Associates, Manhasset, NY</td>
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<td></td>
<td>Amy Sapodin, AuD</td>
<td>Advanced Hearing Center, Albertson, NY</td>
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<td></td>
<td>Leigh A. Sauerbier, AuD</td>
<td>The Advanced Hearing Center, Brooklyn, NY</td>
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<td></td>
<td>Rivka Strom, AuD</td>
<td>Advanced Hearing NY Inc, Brooklyn, NY</td>
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<td>Jennifer Sutton, AuD</td>
<td>Hearing Evaluation Services of Buffalo, Inc</td>
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<td>Lori Trentacoste, AuD</td>
<td>Island Better Hearing Inc</td>
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<td>Carolyn Yates, AuD</td>
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<td>Alexandra Zweig, AuD</td>
<td>New York Institute for Hearing and Balance</td>
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<td>North Carolina</td>
<td>Jennifer Auer, AuD</td>
<td>Audiology Attention &amp; Tinnitus Care PLLC</td>
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<td></td>
<td>Saranne Barker, AuD</td>
<td>Raleigh Hearing &amp; Tinnitus Center, Raleigh, NC</td>
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<td></td>
<td>Susan Bergquist, MS</td>
<td>Heritage Audiology, Wake Forest, NC</td>
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<td></td>
<td>Hannah Heet, AuD</td>
<td>Duke Otolaryngology of Raleigh, Raleigh, NC</td>
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<td>Kelly Knolhoff, AuD</td>
<td>Birkdale Audiology, Huntersville, NC</td>
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<td></td>
<td>Nancy McKenna, AuD</td>
<td>University of North Carolina Chapel Hill</td>
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<td></td>
<td>Melissa Palmer, AuD</td>
<td>High Point Audiology, Clayton, NC</td>
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<td></td>
<td>Caroline Pittman</td>
<td>UNCG Speech and Hearing Center, Greensboro, NC</td>
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<td>Sandra Royle-Tabak, AuD</td>
<td>Carolina East Ear, Nose &amp; Throat, Morehead City, NC</td>
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<td>Christina Seaborg, AuD</td>
<td>Hearing &amp; Balance Center, Charlotte, NC</td>
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<td></td>
<td>Gina Whitenour, FNP</td>
<td>Robeson Family Health, Lumberton, NC</td>
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<td>Ohio</td>
<td>Samantha Bayless, AuD</td>
<td>The Hill Hear Better Clinic, Cincinnati, OH</td>
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<td></td>
<td>Neil Cherian, MD</td>
<td>Cleveland Clinic, Gates Mills, OH</td>
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<td></td>
<td>Sarah Crow, AuD</td>
<td>Modern Hearing Solutions/Choice Hearing Center Cantor, OH</td>
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<td>Sarah E. Curtis, AuD</td>
<td>Sounds of Life Hearing Center, LLC Concord, PA</td>
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<td>Cathy Koosser, LISW</td>
<td>Hillcrest Hearing &amp; Balance Center, Centerville, OH</td>
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<td>Eric Mounts, HIS</td>
<td>Modern Hearing Solutions/Choice Hearing Center Cantor, OH</td>
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<td></td>
<td>Joseph Pietrolungo, DO</td>
<td>Summa Health, Chagrin Falls, OH</td>
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<td></td>
<td>Babette Verbsky, PhD</td>
<td>Hearing Connections Audiology, Lebanon, OH</td>
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<td></td>
<td>Jeffery Vehr, AuD</td>
<td>Hearall Hearing Center, Dayton, OH</td>
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<td></td>
<td>Gail Whitelaw, PhD</td>
<td>The OSU Speech-Language-Hearing Clinic</td>
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<td></td>
<td>Kyle Woods, MA</td>
<td>Modern Hearing Solutions/Choice Hearing Center Cantor, OH</td>
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<tr>
<td>Oklahoma</td>
<td>Suzanne Kimball, AuD</td>
<td>University of Oklahoma Health Sciences Center, Oklahoma City, OK</td>
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<td></td>
<td>Teresa M. Mazza, AuD</td>
<td>Landrum ENT, Ada, OK</td>
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<td></td>
<td>Christy L Mitchell, AuD</td>
<td>Talihna Hearing Clinic, Talihna, OK</td>
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<tr>
<td>Oregon</td>
<td>Anna Forsline, AuD</td>
<td>VA Portland Healthcare System, Portland, OR</td>
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<td></td>
<td>Kristen Furseth, AuD</td>
<td>Williamette ENT, Salem, OR</td>
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<td></td>
<td>James Henry, PhD</td>
<td>National Center for Rehabilitative Auditory</td>
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<td></td>
<td>Todd Landsberg, AuD</td>
<td>South Coast Hearing Center, Coos Bay, OR</td>
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<td></td>
<td>Ha-Sheng Li-Korotky, AuD</td>
<td>Pacific Northwest Audiology LLC, Bend, OR</td>
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<tr>
<td>Pennsylvania</td>
<td>Lisa Blackman, MA</td>
<td>A Hearing Healthcare Center, Philadelphia, PA</td>
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<td>Hearing Technology Associates LLC, Bala Cynwyd, PA</td>
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<td>Berks Hearing Professionals, Birdsboro, PA</td>
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<td>Amy Greer, AuD</td>
<td>Lemme Audiology Associates, Ebersburg, PA</td>
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<td>Holly Puleo, AuD</td>
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<td>Margaret Kalady, AuD</td>
<td>Kalady Audiology, Beaufort, SC</td>
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<td>Alexandra Tarvin, AuD</td>
<td>Elevate Audiology- Hearing and Tinnitus Center, Easley, SC</td>
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<td>Jennifer Waddell, HIS</td>
<td>Sound Hearing Care, Simpsonville, SC</td>
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Editorial Calendar

*Tinnitus Today* magazine is a print and electronic media magazine published in April, August, and December, and circulated to 25,000+ ATA contributors, donors, patients, supporters, researchers, and healthcare professionals.

The magazine editorial team empowers readers with information, including up-to-date medical and research news, feature articles on urgent tinnitus issues, questions and answers, self-help suggestions, and letters to the editor from others with tinnitus. Strong service journalism, compelling storytelling, first-person narrative, and profiles are presented in a warm, vibrant, and inviting format to encourage readers to reflect, engage, and better understand a medical condition that affects millions.

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To advertise, contact: tinnitus@ata.org

MISSION AND CORE PURPOSE

The mission and core purpose of the ATA are to promote relief, help prevent, and find cures for tinnitus evidenced by its core values of compassion, credibility, and responsibility.

CORE VALUES AND GUIDING PRINCIPLES

*Compassion:* Evidenced in a spirit of hope reflected in the commitment to finding a cure, preventing the condition, and supporting those affected by the condition.

*Credibility:* Evidenced in accurate information from reliable sources, transparency in decision-making, and an earned reputation for trustworthiness.

*Responsibility:* Evidenced in patient-centered advocacy by a collaborative community of forward thinking leaders accountable to its mission and members.

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Podcasts

ATA's Conversations in Tinnitus, with John A. Coverstone, AuD, and Dean Flyger, AuD

Tune In to Conversations in Tinnitus to Stay Abreast of Tinnitus Research and News

The American Tinnitus Association’s podcasts are available 24/7 to help you stay abreast of tinnitus research and other tinnitus topics. Just like listening to music on your smartphone or computer, you can tune in to Conversations in Tinnitus podcasts, cohosted by John A. Coverstone, AuD, and Dean Flyger, AuD, while you work out, take a walk, relax at home, or commute to work. To access and learn more about this unique and compelling series, visit our website at www.ata.org. To enhance listening comprehension and accommodate those with noise sensitivity, transcripts are available with each podcast.

Podcast 14: Does Diet Play a Role in Tinnitus and Hearing Health?
SUBJECT MATTER EXPERT: Christopher Spankovich, PhD, MPH
TOPIC: Dr. Spankovich discusses the influence of nutrition on hearing health and tinnitus, based on extensive research on the subject. He outlines what everyone should know about how nutrition can contribute to better hearing or hearing problems. As a researcher and clinician, he also shares recommendations he makes to patients so they can better manage their tinnitus and overall hearing health.

Podcast 15: Does Tinnitus Retraining Therapy Improve Quality of Life?
SUBJECT MATTER EXPERTS: Roberta Scherer, PhD, and Craig Formby, PhD
TOPIC: Drs. Scherer and Formby guide us through the decades-long journey to conduct the first and only phase III trial of tinnitus retraining therapy, an influential habituation-based treatment protocol for alleviating the negative reactions to tinnitus. The researchers explore findings that highlight the importance of sound enrichment and working with a caring and qualified healthcare provider.

Podcast 16: Exploring Noninvasive Neurosensory Tinnitus Treatment
SUBJECT MATTER EXPERT: Hubert Lim, PhD
TOPIC: Dr. Lim, a leading scientist and thought leader in auditory neuroscience, discusses the research and development of non-invasive bimodal neuromodulation for treatment of tinnitus. He explains the scientific concept and the research being conducted, which is aimed at developing a treatment that decreases the perception of the tinnitus sound and the negative emotional reactions caused by it.

Podcast 17: Understanding the Problem of Painful Hyperacusis
SUBJECT MATTER EXPERT: Bryan Pollard, BA
TOPIC: Bryan Pollard, founder of the nonprofit Hyperacusis Research, explains what it is like to live with noise-induced pain and what is known about this often overlooked condition. As someone who lives with painful hyperacusis and tinnitus, Pollard provides unique insight into the struggles, his mission to increase research on the condition, and the importance of developing tools to enable sufferers to return to a more normal life, without fear of setbacks.

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