An Ounce of Prev is Worth a P

by James W. Hall III, Ph.D.

Tinnitus is a symptom, not a disease. It's important to always remember this simple fact. When someone begins noticing an unusual sound in his or her ears, whether it's a ringing, buzzing, roaring, cricket sound, or any other sound or combination of sounds, the first logical step is to discover the underlying disorder related to the tinnitus. The exact type of tinnitus sound that a person hears is not important diagnostically. Almost all tinnitus is associated with a disorder in the auditory system — that is, somewhere within the ear or the nerves that carry signals from the inner ear to the hearing parts of the brain. By analyzing information from the patient (what health professionals call "taking a history") in combination with the results of diagnostic tests, a physician and an audiologist can usually rule out the diseases that include tinnitus as a symptom.

The majority of people with tinnitus do not have an active disease or pathology but, rather, damage or dysfunction within the inner ear that is related to exposure to high levels of sound and/or to the aging process. Nonetheless, until disease or pathology is ruled out with a thorough diagnostic assessment, it is irresponsible to simply offer to a person with tinnitus reassurance that "it's nothing to be concerned about…most people hear sounds like that."

Persistent or almost constant tinnitus is very different from the temporary ringing-type tinnitus – called spontaneous transient tinnitus – that most people notice from time to time. Spontaneous transient tinnitus typically occurs abruptly, often when a person is in a quiet setting. The ringing sound lasts only seconds, then fades away. Hearing might be muffled during this brief time period. The precise scientific explanation for spontaneous transient tinnitus is not known, but there is general agreement that it is a normal auditory experience and not a reason for concern about health or hearing.

There is evidence, dating back more than 50 years, that tinnitus can be viewed as a normal auditory experience. In 1953, an otologist (a medical doctor specializing in the ear) and an audiologist conducted a very clever study (Heller and Bergman, 1953). Eighty people were enrolled as subjects in the study. Morris Heller, M.D., verified by medical history and a physical examination that the subjects had no ear disease, while Moe Bergman, Ph.D., performed an audiogram (a simple test of hearing tones) to confirm that the subjects had normal hearing sensitivity. One by one, the subjects were placed in a specialized sound-treated room. Upon emerging from the room, these normal-hearing subjects were asked if they heard anything. The vast majority (75 out of the 80, or 94%) reported that they heard some type of sound in the room. The three sounds described most often by the subjects were "humming," "buzzing," and "ringing," although a diverse collection of 23 other sounds were also noted (e.g., whistling, squeaking, and a thumping pulsation). Because of this study, we've learned that almost everyone will hear sounds…that is, tinnitus…in a very quiet setting.

It's reasonable to assume that most people who are reading an article in *Tinnitus Today* already hear their tinnitus. Therefore, you might think it's too late to prevent a problem that already exists. But there is a type of prevention that is important to focus on – the prevention of deteriorating quality of life sometimes brought about by persistent tinnitus.

Knowledge is Power.
—Francis Bacon

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Hearing Protection – The First Line of Defense

The old adage coined by Ben Franklin, "An ounce of prevention is worth a pound of cure," certainly applies in any discussion of the best treatment strategy for tinnitus. The most common single cause of hearing loss and tinnitus in adults is exposure to excessive sound levels. As a rule, sound levels that you have to shout over to be heard can cause inner ear damage. The source or type of sound — for example, rock or classic music, gunfire, machinery noise, factory noise, or fireworks — does not determine the risk for hearing loss. The two most important factors that determine the risk for hearing loss are the intensity (or loudness) of the sound and the length of time that a person is exposed to the sound. There is also a genetic factor in the susceptibility to noise-induced hearing loss. That is, some people are more likely to sustain damage to the tiny and delicate hair cells in the inner ear than others. Two people may be exposed to the same levels of noise for the same duration of time, for example, two factory workers or two musicians in an orchestra or a rock band. Despite the similarity in sound exposure, one person will develop a significant and permanent hearing loss, while the other person's hearing will remain normal.

Other risk factors are associated with the onset of tinnitus, among them middle ear problems (pressure imbalances behind the eardrum due to Eustachian tube dysfunction), sinus disease, temporomandibular joint (TMJ) disorders, high levels of personal stress, and some drugs used to treat health problems unrelated to tinnitus. In my clinical experience, a person will often first notice tinnitus when *two or more* of these risk factors occur during the same period of time. Prompt medical or, as appropriate, non-medical attention to each of these disorders can help prevent persistent tinnitus.

Professional Care – the Second Line of Defense

You may already have bothersome tinnitus. But you can prevent further deterioration in the quality of your life. In fact, you can almost always return to the quality of life you enjoyed in the past — before it was negatively affected by tinnitus. Knowledge is an essential ingredient in the process of restoring quality of life and of recovering from the debilitating effects of tinnitus. For a person with tinnitus, knowledge is truly power. What does a person with tinnitus need to know?

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Sometimes, the silence can be like thunder.

— Bob Dylan

An Ounce of Prevention (continued)

• Tinnitus is a symptom, not a disease or pathology. The first logical step in the treatment of tinnitus is to determine whether or not it is a symptom of a medically treatable disease, and then to receive appropriate medical management. Each year, millions of Americans experience tinnitus that is unrelated to active ear disease or pathology.

• A person with tinnitus needs to know as much as possible about his or her hearing. Following a simple medical examination, a physician often tells the person with tinnitus, "There's nothing wrong with your hearing." This statement is rarely accurate. A detailed audiologic assessment almost always shows a disruption in normal auditory functioning. The common and sometimes minor form of auditory dysfunction due to aging or noise exposure poses no health risk, and it may not even require a hearing aid. However, for a person with very bothersome tinnitus, documentation of his or her auditory problem will validate the concerns about the tinnitus and provide an understandable explanation for the tinnitus. This is an important step in the effective tinnitus management.

• Environmental sound enrichment can minimize the perception of tinnitus and, over time, contribute to retraining of the brain to ignore or "habituate" the tinnitus.

• People with tinnitus should avoid silence and, instead, surround themselves with pleasant sound. Inexpensive devices that generate a constant, low-level, pleasant background sound are available at a number of stores and online. For the person with tinnitus, sound-generating devices should be used at all times – in the home and in the office. At bedtime, a special sound pillow can be easily plugged into a tabletop sound machine or CD player. In the presence of soft background sound, the brain must work harder to detect the tinnitus. Since the background sound is not important or meaningful, the brain can gradually tune it out. While tuning out the background sound, the brain can tune out the tinnitus as well.

Every person with tinnitus has reason to be hopeful. With the adherence to some straightforward strategies, it is often possible to prevent the onset of bothersome tinnitus. There is no "magic pill" for the treatment of tinnitus. However, with the services of a skilled tinnitus professional, people with tinnitus that negatively affects their quality of life can usually return to the point where the tinnitus was no longer persistent, and no longer a concern.

Reference

Heller, M.F., and Bergman, M. (1953). Tinnitus in normally hearing persons. *Annals of Otology, Laryngology, and Rhinology* 62: 73-93.

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Anti-Vertigo Drug to be Studied for Balance Disorders and Tinnitus

Researchers at the University of Arkansas for Medical Sciences (UAMS) received funding from the National Institutes of Health to study the drug *scopolamine* in relieving the symptoms of space motion sickness. An earlier study, done in conjunction with NASA, revealed scopolamine as the optimal drug for space motion sickness due to rotation.

Expanding on that study, UAMS researcher John L. Dornhoffer, M.D., will evaluate patients with tinnitus and vertigo to determine the extent of central nervous system (CNS) deficits which underlie some of the symptoms associated with these conditions – particularly fatigue, inability to concentrate, and depression. The ability of scopolamine to control CNS deficits in these patients will then be evaluated.

For now, due to a temporary unavailability of intranasal scopolamine, the focus of the study has shifted. Researchers will look for the level of CNS involvement in tinnitus to find new therapies to alleviate or lessen the associated symptoms.

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