

Can Magnesium Relieve Your Tinnitus?

Analysis by [Dr. Joseph Mercola](#)

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STORY AT-A-GLANCE

- › Nearly 15% of the U.S. suffers from tinnitus – the perception of sound when no external sound is present, as a result of exposure to loud noises, medications, infection or disease
- › Although not curable, there are treatments that may reduce the severity of symptoms, including supplementation with magnesium, zinc or ginkgo biloba
- › Preventive strategies reduce your risk of suffering tinnitus; symptom severity may also be affected by other nutrients and tinnitus retraining therapy

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Nearly 50 million Americans experience tinnitus, or nearly 15% of the U.S. population.¹ Tinnitus is the perception of sound when there is no external sound present. Others can't hear what you're hearing, and it's often referred to as "ringing in the ears."

However, the reference to ringing doesn't exactly ring true, as sufferers may complain of sounds that include hissing, buzzing, whistling or swooshing.² For many, the condition resolves after a couple of days, but roughly 20 million struggle with chronic tinnitus, while 2 million have a debilitating form of the condition.

Currently, there is no cure, but there are treatment options that give sufferers better quality of life and may reduce the severity of the symptoms.

Historically, tinnitus develops in those over the age of 50. Research is now demonstrating the incidence is rising, even among young people, which is thought to be

the result of increased exposure to loud environmental noise.

Unfortunately, tinnitus may be a future predictor of hearing loss, possibly related to other lifestyle choices, such as listening to loud music, using earbuds and using mobile phones. In a study from McMaster University in Canada, researchers are finding more children than expected between ages 11 and 17 with early tinnitus.³ According to study author Larry Roberts, Ph.D.:⁴

"It's a growing problem and I think it's going to get worse. My personal view is that there is a major public health challenge coming down the road in terms of difficulties with hearing."

How Tinnitus Develops

After listening to loud music, you may notice a slight ringing in your ears that resolves over a short period of time. More than half of the students in the study from McMaster University had experienced this transient tinnitus and 28% had developed persistent early tinnitus.⁵

Neurological damage or damage to the small hairs that line your inner ear and vibrate in response to sound waves can result in tinnitus,⁶ and you may experience the condition in one or both ears.⁷

Auditory signals are sent from small structures in the ear to the cochlea and are transmitted to a structure in the brain called the dorsal cochlear nucleus. The dorsal cochlear nucleus has the capability of boosting or reducing sound, which may be compromised after multiple exposures to loud noise.

Researchers found that repetitive exposure to loud noise also alters brain plasticity. The development of tinnitus may also result from infection, medications and age.⁸ Tinnitus can also be a symptom of Meniere's disease, a condition affecting the balance mechanism in the inner ear.

A buildup of earwax in the outer ear may cause pressure and affect the development of tinnitus. Hypertension, anxiety and stress are also associated with the development of the condition. After exposure to loud noise, you may find a short period of time where sound is subdued and it feels like the world turned down the volume.

During this period, your dorsal cochlear nucleus may try to compensate by boosting the auditory signal. While successful, it may result in a memory that triggers tinnitus, often in a specific sound frequency.

The consequence is hearing sound when there is no sound, as your dorsal cochlear nucleus continues to boost an auditory signal. Researchers have now identified a mineral that may prevent the dorsal cochlear nucleus from permanently turning up the dial and triggering chronic tinnitus.

Magnesium Supplementation May Reduce Symptoms

Studies have demonstrated an improvement in hearing when participants, who suffer from sensorineural or noise-induced hearing loss, are supplemented with magnesium.⁹

Magnesium intake in the U.S. is well below recommended levels,¹⁰ which may increase your potential risk of tinnitus. In the video above, I review the importance of choosing the right type of magnesium supplement.

To determine if using magnesium supplementation could reduce symptoms, participants with chronic tinnitus were asked to take a magnesium supplement for three months. The 26 individuals evaluated and recorded their symptoms daily, using the Tinnitus Distress Rating Scale.

Researchers also administered the Tinnitus Handicap Inventory before and after the intervention. Of the 26 participants who enrolled, 19 finished the study.¹¹

Participants who ranked their symptoms as "slight" or greater on either scale before the supplementation, experienced a significant decrease in the severity of their symptoms after the intervention was completed.

The researchers concluded that magnesium supplementation had a beneficial effect. Magnesium helps maintain normal nerve function, including the nerves that are involved in hearing. However, while magnesium may help reduce tinnitus and hearing loss, taking supplementation is not a reason to purposefully expose yourself to loud noises.

Magnesium is also a powerful glutamate inhibitor. Glutamate is a neurotransmitter produced by hair cells in your inner ear when they are affected by sound waves. If glutamate is unregulated by a deficiency in magnesium, it may affect the development of tinnitus.¹²

Magnesium also helps to relax blood vessels, which may improve blood flow to the cochlea in the inner ear.¹³ Improved blood flow may help transport protective antioxidants to the inner ear.

Magnesium Deficiency May Affect More Health Conditions

Animal studies demonstrate a deficiency in magnesium increases the risk of noise-induced hearing loss, but magnesium deficiency affects far more than your hearing. Magnesium is involved in the metabolism of carbohydrates and energy production, creation of DNA and RNA, and is a structural component in bone, cells walls and chromosomes.¹⁴

Symptoms of overt magnesium deficiency are relatively rare, as the mineral is plentiful in many foods and your body is able to limit excretion through your kidneys when your supply is limited. However, while overt deficiency is rare, many Americans do not get enough magnesium from their diet, which may contribute to symptoms related to low levels of the mineral.

Several health conditions may increase your risk of magnesium deficiency or low levels that contribute to symptoms, including gastrointestinal disorders that may lead to depletion of magnesium, age-related reduction in absorption, health conditions such as diabetes, which may cause your body to excrete more magnesium, and chronic alcoholism.¹⁵ Low levels of magnesium, in turn, can contribute to the development of:

Metabolic syndrome	Hypertension	Diabetes
Cardiovascular disease	Heart arrhythmias	Osteoporosis
Complications in pregnancy	Pre-eclampsia and eclampsia	Asthma
Stroke	Endothelial dysfunction	Migraine headaches

Psychiatric Disorders and Stress Associated With Tinnitus

Many adults who suffer from tinnitus also have coexisting psychiatric disorders that range from anxiety to personality disorders. In fact, some researchers suggest tinnitus is not simply a condition affecting the auditory system, but rather is neuropsychiatric in nature, which would explain why it often occurs alongside cognitive and behavioral symptoms.

Depression affects 62% of people with tinnitus.¹⁶ Stress is both a predictor and coexisting condition in people who suffer from tinnitus. In one study, stress was a strong predictor of the severity of the symptoms.¹⁷ Many people who suffer from tinnitus notice their first symptoms occur during a stressful life event, such as a sickness in a family member, accident or surgery, divorce or being laid off. As noted in the Journal of Neurology, Neurosurgery and Psychiatry:¹⁸

"These events can heighten the brain's arousal, and the tinnitus may be noted cortically [by the cerebral cortex]. This interaction between reduced auditory sensation and brain compensation might explain why some people are very bothered by their tinnitus and others just adjust to it."

Other Vitamins Impact Hearing Loss and Tinnitus

Other vitamins also impact hearing loss and tinnitus. These include:^{19,20}

Vitamin C – Vitamin C may protect against noise-induced hearing loss. Food sources include citrus fruits, tomatoes, broccoli and strawberries.²¹

Beta-carotene – Increased intake is associated with better hearing at speech and high frequencies. Food sources include orange colored foods such as **carrots**, pumpkin and winter squash.²²

Antioxidants – These help neutralize reactive oxygen species involved in the progression of tinnitus. Food sources include wild blueberries, pecans, artichokes, cilantro, cranberries and blackberries.²³

Lipoic acid – Reduces age-related hearing loss and is found in spinach, broccoli and animal organ meats.²⁴

Folate and vitamin B12 – Important to the health of nerve cells, these vitamins reduce levels of homocysteine linked to higher risk of hearing problems. Food sources include lentils, chickpeas, spinach and asparagus.²⁵

Melatonin – A hormone critical for sleep, it is also effective against hearing loss resulting from loud noise. You may boost your melatonin naturally by practicing healthy sleep habits.

Ginkgo biloba – An herbal supplement that may protect against hearing loss and reduce severity of tinnitus symptoms.

Coenzyme Q10 (CoQ10) – Antioxidant that supports mitochondrial function and may reduce noise-induced hearing loss. Found in beef, herring, chicken, sesame seeds and broccoli.²⁶

Zinc – A mineral important to your nervous system, zinc has antioxidant and anti-inflammatory properties. Food sources include oysters, beef, chicken, cashews and almonds.²⁷

Taurine — May help reduce the severity of tinnitus and has demonstrated a protective effect in hearing loss associated with medication use. Food sources include seafood and meat. Your body can metabolize taurine from cysteine, but age reduces this ability.²⁸

Specific Noise Frequencies May Combat Tinnitus

While there is no cure for the condition, some are able to acclimate to the tinnitus so it isn't as disruptive to their daily lives. Essentially, a tinnitus retraining therapy program can help retrain your brain to "tune out" the noise generated by your nerve cells. The type of sound used in the therapy is determined by how the condition is experienced; some suffer from a constant high-pitched ringing, while others hear a steady series of swooshing sounds.

Tinnitus retraining therapy, also called habituation, works by conditioning your brain as you listen to background noise or music during your waking hours. This is intended to distract your brain from tinnitus and help the brain to effectively "forget" it's occurring.²⁹

However, it's important to choose the right type of environmental noise to treat your specific tinnitus. Your therapy will account for spectral density of sound, which is how power from sound signals are distributed through frequencies. The sound of your tinnitus operates at different frequencies, and so will the sound used in your therapy.

White noise is like the sound of a fan, which appears to work best for people who suffer from tinnitus that sounds like a shushing. White noise combines high and low frequencies, much like a sound equalizer. Pink noise may sound like a waterfall, or rain on a roof, and may help relax your mind and encourage more restful sleep.³⁰

Red/brown noise is any sound that mimics Brownian motion, or a random placement of particles in liquid and the subsequent collisions between fast moving atoms and molecules. This type of sound is best suited for tinnitus that responds well to low sounds, like thunder.

Tips to Protect Your Hearing

It's estimated that half of cases of hearing loss are avoidable.³¹ Protecting yourself from loud noises is the first step in preventing both tinnitus and hearing loss. Eating a healthy and varied diet of whole foods can help prevent age-related hearing loss by optimizing your intake of vitamin rich foods. The following recommendations may also help prevent hearing loss or tinnitus:

Turn down the volume on personal audio devices.

Download a decibel meter app for your smartphone, which will flash a warning if the volume is turned up to a potentially damaging level.

Wear earplugs when you visit noisy venues. If you work in a noisy environment, be sure to wear ear protection at all times.

Use carefully fitted noise-canceling earphones/headphones, which may allow you to listen comfortably at a lower volume.

Limit the amount of time you spend engaged in noisy activities.

Take regular listening breaks when using personal audio devices.

Restrict the daily use of personal audio devices to less than one hour.

If you live in a very noisy area, you may want to consider moving. If moving is not an option, consider adding acoustical tile to your ceiling and walls to buffer noise. Double-paneled windows, insulation, heavy curtains and rugs can also help reduce noise volume.

Use sound-blocking headphones to eliminate occasional sound disturbances such as that from traffic or lawnmowers. Wear ear protection when using your lawnmower or leaf blower.

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