

# HEARING HEALTH CARE NEWS™



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Tinnitus (tin-i-tus or tin-night-us) is estimated to plague nearly 50 million American adults, and it is ***not*** a coincidence that nearly 50 million older adults also live with hearing loss. For most people the two (tinnitus & hearing loss) come together. Tinnitus is simply described as the experience of hearing a sound in your ears, sometimes in your head, and is experienced by approximately 80% of people living with hearing loss. Some only notice their tinnitus in a quiet room, whereas many others experience the sound all day long, and it can interfere with daily life. The sound can cause depression, anxiety and affect concentration.

Nearly every patient with tinnitus is seeking the answers to **'why'** they have the ringing and **'how'** they can get rid of it! These are not the easiest questions to answer. However, in the vast majority of cases, tinnitus is the result of hearing loss (that causes a breakdown in neural connections within the brain) and **yes** there are very effective treatments available. The initial cause of the hearing loss can vary, be it from aging, noise exposure, certain medications, virus, etc., but the result is nearly the same – ringing in the ears/head that can be treated in most patients.

A smaller percentage of tinnitus cases are the result of other medical conditions that include:

- hypertension (high blood pressure)
- thyroid disease
- vascular disorder
- temporomandibular joint (TMJ) disorder.

In some patients, prescription and over-the-counter drugs can result in damage to the auditory system and cause or exacerbate tinnitus. Several hundred drugs listed in the Physician's Desk Reference ("PDR") cite tinnitus as a side effect! In some, but very few of these cases, the tinnitus may reduce or disappear when the prescribed medication is discontinued.

**The Theory of Tinnitus:** Tinnitus is most often the result of a 'central gain' in neural activity that occurs when there

is a loss of proper neural stimulation from the ear (i.e. after there is damage to the hair cells and nerves connecting the ear to the brain). More simply - when the brain is not properly stimulated in individuals with hearing loss (even a mild hearing loss), the brain will increase activity to make up for the missing input.

This 'central gain' is neurologically analogous to 'phantom limb' phenomenon studied in neurology. In cases where damage occurs to the peripheral nervous system, e.g. when a soldier loses a limb in battle, the central nervous system (aka the brain) will undergo adaptive changes that can often result in the perception of pain.

Our ears do not have traditional 'pain receptors', rather the perception of 'pain' that results from damage to the ear is perceived as a 'phantom sound' (i.e. tinnitus). As the brain tries to adapt to the lack of proper stimulation from the ears, it will begin to experience a gain of activity that results in our perception of sound.

## Understanding Tinnitus: Treatment Options

Unfortunately, too many patients think there is nothing that can be done about the ringing. Frankly, in most cases, this just isn't true. Below are some of the most effective treatment options available for managing tinnitus.

**Tinnitus and NeuroTechnology™:** The most effective treatment option available for patients suffering with tinnitus is with technology capable of stimulating the auditory system. This technology is an F.D.A approved treatment for individuals with tinnitus. Many studies have indicated that patients who use tinnitus support technology have a significant reduction in their daily tinnitus experience – with some even reporting that 'the ringing is gone all day!'

**Tinnitus and Brain Training:** Tinnitus can plague patients... and a limited amount may not perceive a significant difference with the use of NeuroTechnology™ to restore stimulation to the auditory system and brain. Fortunately,

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exciting new research was recently published in the Journal of American Medical Association (JAMA) pointing to a new BrainHQ game that can significantly reduce a patient's perception of tinnitus.

*'Researchers found that patients with tinnitus, in the group with tinnitus, had improvements in tinnitus perception, memory attention, and concentration as compared with patients in the control group.'*

– Dr. Piccirillo. Journal of American Medical Association, Otolaryngology

There is still significant research to be done in this area - there needs to be new exercises and improvements to the existing set—but seeing brain plasticity in patients with tinnitus is a great start!



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