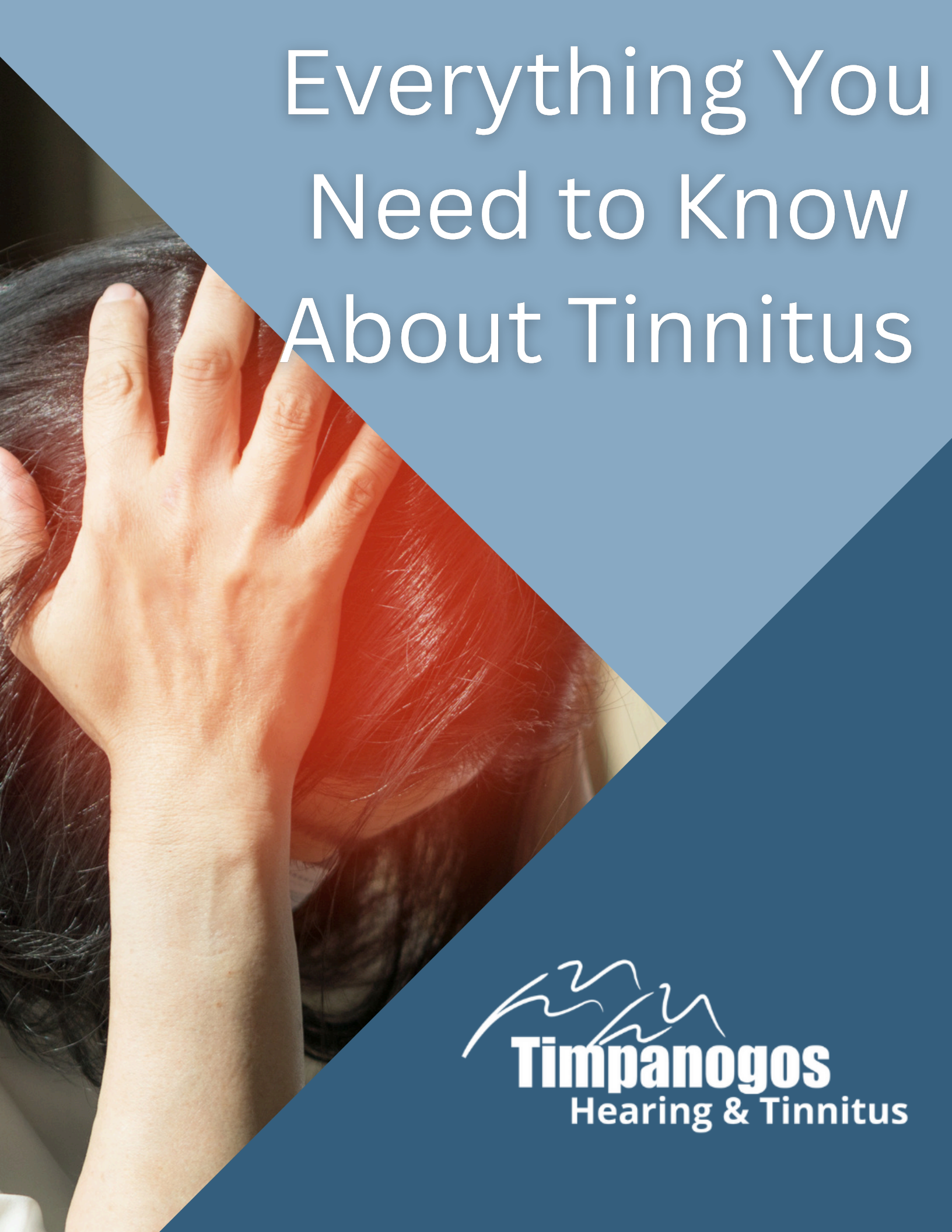


Everything You Need to Know About Tinnitus

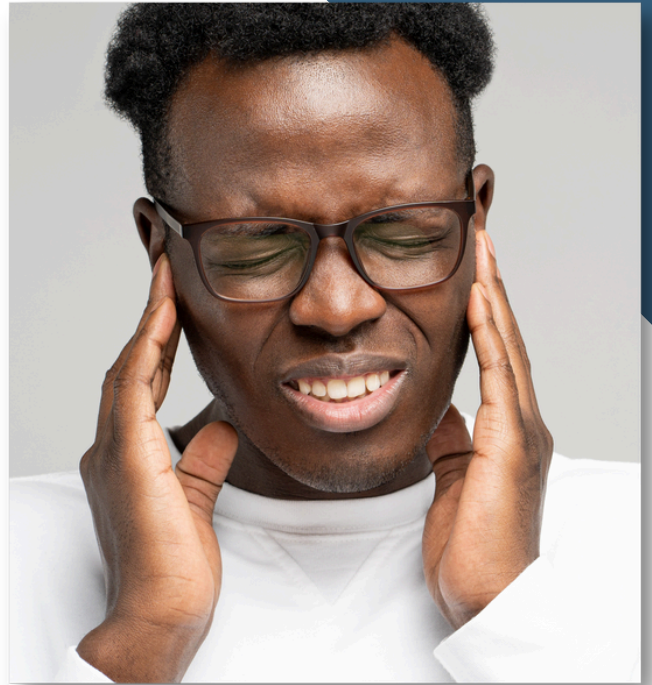
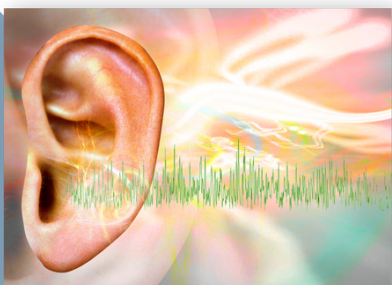



Timpanogos
Hearing & Tinnitus

Introduction

Tinnitus (pronounced TIN-ni-tus or tin-NIGHT-us; either is correct!) is more than 90% of the time, attributed to the progressive and degenerative loss of nerves connecting the ear to the brain, aka HEARING LOSS. Tinnitus is really just the fancy word for 'ringing in your ears' or 'ringing in your head'. Ironically, people with hearing loss are often described as 'suffering in silence', when in fact, that is exactly the opposite, as tinnitus is anything but silent to the sufferer and it can have a severe impact on quality of life.

Simply put, as the nerves break down (from aging, genetics, noise exposure, medications, viruses, etc.,) the brain automatically makes up for the missing signal and create the false perception of sound. This 'central gain' of neural activity can be altered with treatment (aka neuroplasticity), and therefore reduce the experience of tinnitus. With patience, sticking to an FDA approved treatment plan, and a little time, patients treated in our practice generally have tremendous success in reducing and/or eliminating their tinnitus. Chances are, when we begin your treatment, you have an 80-85% chance of living with less (or no) tinnitus. While I am not really a gambler... I like those odds!

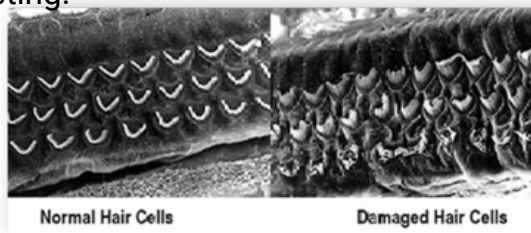


The Numbers and the Science of Tinnitus

The American Tinnitus Association estimates that nearly 50,000,000 American adults live with tinnitus. Tinnitus is simply described as the experience of hearing a sound in your ears, sometimes in your head. Tinnitus is also experienced by approximately 80% of people living with hearing loss. Some people only notice their tinnitus in a quiet room, whereas many others experience the sound all day long – and it can interfere with daily life. In some people, the sound can cause depression, anxiety and affect concentration. Nearly every patient will ask us “What is causing the ringing in my ears?”

Admittedly, that is not the easiest question to

answer. However, it can be answered once a hearing care specialist is able to dig deeper in to the symptoms, recognize the individual's tinnitus triggers, and have a full understanding of the patient's hearing profile and results of a complete audiological evaluation that includes cognitive function testing.



The most common cause of tinnitus is damage to the sensory organ of hearing, the cochlea (i.e. the inner ear). The cochlea is to hearing what your eyes are to vision. Within the cochlea are tiny 'hair-like' cells. When these cells are damaged, the nerves that connect the hair cells to the brain (and give us the ability to hear), also become permanently damaged; and often times the ringing will ensue. The most common cause of damage to our hair cells is aging. Think about it – as we get older, we tend not to see as well or see as sharply as we used to; especially in low-light environments. Unfortunately, the same process happens in our ears as we age; we tend not to hear as clearly, especially in noisy situations.

Other causes of tinnitus that result in hair cell damage include excessive noise exposure – either a single intense noise (like a shotgun blast) or long-term exposure either from work or play (e.g. musicians, concert attendees, carpenters, machinist, landscapers, etc.).

Tinnitus can also result from physical trauma to the head or neck. Physical trauma to the head that can impact hearing and tinnitus is commonly found in individuals that have been in a car accident or for those who have had a slip and fall.

A smaller percentage of tinnitus cases are the result of other medical conditions that include: hypertension (high blood pressure), acoustic neuroma (tumor on the hearing nerve), thyroid disease, vascular disorder, temporomandibular joint (TMJ) disorder, ear infection, impacted cerumen (ear wax), nutritional deficiency, aneurysm, multiple sclerosis and other disorders.



In some patients, prescription and over-the-counter drugs can result in damage to the auditory system and cause or exacerbate tinnitus. Ironically, 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.

Why Does Tinnitus Occur?

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 neuroscience. 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, itching, or burning in the missing limb.



Our ears do not have traditional 'pain receptors', rather the perception of 'pain' that results from damage to the hair cells and nerves of the auditory system are 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 Triggers

For many patients, the ringing can be virtually undetectable until a certain 'trigger' ramps up the volume of the sound. Below is a list of the most common triggers patients report as influencing their Tinnitus:

- **Loud noise.** Avoid loud sounds at all costs! The use of power tools, guns, motor cycles, noisy vacuum cleaners, etc. must require the use of hearing protection. While the ringing that occurs after exposure to loud sounds and concerts may seem temporary (often referred to as the 'hearing hangover'), the damage is PERMANENT. Hearing protection comes in all shapes and sizes, and they are not all created equally. Ask your hearing healthcare provider which type is best for you and your hearing needs.

- **Excessive use of alcohol or so-called recreational drugs** can exacerbate tinnitus in some individuals. Toxins introduced to the body can have a range of effects on our nervous system. Alcohol and drugs exert their effects on people by influencing neural activity; thus, tinnitus is a potential side effect of these toxins.
- **Caffeine**, found in coffee, tea, chocolate and some cola drinks, may also increase tinnitus. Like most things in life, nothing is that bad for you in moderation. However, when most things are taken in excess, they can have adverse side effects. Caffeine, a nervous system stimulant, can ramp up neural activity and lead to the brain's perception of sound. Fortunately, when tinnitus results from the ingestion of caffeine, the simple fix is to reduce your intake.
- **Nicotine** has a direct effect on our vascular system. Changes to our vascular system, which are often times permanent from nicotine and smoking, can influence blood flow to the ears – which will have a direct effect on the health of the cochlea and hair cells. This impact can lead to a 'suffocation' of required oxygen to the ear and thereby compromise neural connections to the brain; thus, resulting in tinnitus.



Understanding Tinnitus: Treatment Options

There are many people out there advertising “cures” for tinnitus— everything from medicine, to electro-shock therapy, to acupuncture. The American Academy of Otolaryngology (AAO) released a Clinical Practice Guideline with a Tinnitus Executive Summary in October 2014 and here are their definitive recommendations:

MEDICAL THERAPY: Clinicians **should not** routinely recommend antidepressants, anticonvulsants, anxiolytics, or intratympanic medications for a primary indication of treating persistent, bothersome tinnitus.

DIETARY SUPPLEMENTS: Clinicians **should not** recommend ginkgo biloba, melatonin, zinc, or other dietary supplements for treating patients with persistent, bothersome tinnitus.

ACUPUNCTURE: **No recommendation** can be made regarding the effect of acupuncture in patients with persistent bothersome tinnitus. No recommendation based on poor quality trials, no benefit, and minimal harm.

TRANSCRANIAL MAGNETIC STIMULATION (TMS): Clinicians **should not** recommend TMS for the routine treatment of patients with persistent, bothersome and chronic tinnitus. Recommendation against TMS based on inconclusive research.

Low-Level Laser Therapy (LLLT)

Low-Level Laser Therapy (LLLT) uses low-intensity lasers or light-emitting diodes to stimulate cellular function and promote healing. Despite claims that LLLT can reduce tinnitus symptoms, scientific studies have not demonstrated consistent benefits. The AAO **does not recommend** LLLT for tinnitus due to the lack of high-quality evidence supporting its efficacy.

EDUCATION AND COUNSELING: Clinicians **should** educate patients with persistent, bothersome tinnitus about management strategies. Recommendation based on studies of the value of education and counseling, with a preponderance of benefit over harm.

HEARING AID EVALUATION: Clinicians **should** recommend a hearing aid evaluation for patients with hearing loss and persistent, bothersome tinnitus. Recommendation based on observational studies with a preponderance of benefit over harm.



SOUND THERAPY: Clinicians **may recommend** sound therapy to patients with persistent, bothersome tinnitus.

COGNITIVE-BEHAVIORAL THERAPY (CBT): Clinicians **should recommend** CBT to patients with persistent, bothersome tinnitus.

Unfortunately, too many patients have said to us 'I have tinnitus, and I've been told there is nothing that I can do about it'. I emphatically say to each of these patients, and to you – that is not true! Is there a cure for Tinnitus? No. Are there valid, AAO recommended treatment options available to reduce, and in some cases, eliminate, the ringing? YES!



The Timpanogos Hearing & Tinnitus Treatment Plan

Based on the AAO recommendations, as well as more recent research from Jacquemin et al (*International Journal of Audiology*, 2021), Aazh & Danesh (*American Academy of Audiology*, 2021), Lan et al. (*Frontiers in Psychology* 2021) and Yakunina et. al (*Otology & Neurotology*, 2019, as well as the ground-breaking research on bimodal neuromodulation by Boedts, Michael, et al. (*Nature Communications*, August 2024) we have developed a treatment approach that incorporates the best practice methods for tinnitus treatment.



Restoring Sound Through Amplification

First is the treatment with which we've seen the most success after treating literally thousands of patients— hearing devices specifically designed and programmed to replace the missing stimulation to your brain— effectively negating the auditory damage causing the tinnitus. And yes, this does mean hearing aids.

There have been 34 studies to date on the effectiveness of using hearing devices to treat tinnitus and all 34 studies found it to be an effective treatment. The Academy of Otolaryngology has actually stated that even marginal hearing aid candidates should be fit with hearing aids to treat their tinnitus.

Some patients are resistant to the idea of wearing hearing aids to treat tinnitus. For these patients, it is important to note that research from the last 10 years indicates that untreated or undertreated hearing loss has negative consequences, including increased risk of dementia and cognitive decline, increased risk of falling, and increased risk of cognitive overload— not to mention the tinnitus you are already experiencing. By treating the hearing loss most likely causing your tinnitus, patients can decrease your risk of these negative consequences.

It is important to note that not all hearing aids are suitable for treating tinnitus. For example, over-the-counter hearing aids that you can buy at the corner drug store are not approved for treating tinnitus and may or may not provide the other health benefits above.



Bimodal Neuromodulation with Lenire

There are some people who wouldn't receive any benefit from wearing hearing devices, or who refuse to wear them. There are some who are currently wearing hearing devices but not seeing as much relief of their tinnitus as they would like. For those people, Lenire is an effective, FDA approved, tinnitus treatment device using bimodal neuromodulation to facilitate tinnitus adaptation in the brain and decrease the experience of tinnitus.

Bimodal neuromodulation the stimulation of two nerves at the same time. Lenire stimulates nerves in the tongue as well as the ear. Research suggests that the combined stimulation of these two nerves simultaneously drives stronger adaptive neuroplasticity, which can reduce the brain's attention and sensitivity to tinnitus. It sounds crazy, but the research shows that 83% of Lenire users find relief and would recommend it for others suffering from tinnitus.

Recent data from the August 2024 Tent A-3 controlled trial of Lenire showed that 70.5% of participants with moderate or worse tinnitus who experienced no clinically meaningful improvement from six weeks of sound-only stimulation reported clinically significant improvement in their tinnitus severity following six weeks of treatment with Lenire.

Adaptation Therapy with My Tinnitus Therapy

The third effective treatment for tinnitus is adaptation therapy using mindfulness, relaxation techniques, and other cognitive therapeutic tools. We have created a proprietary 8 week online program to deliver this adaptation therapy called My Tinnitus Therapy. When done in conjunction with hearing devices and/or Lenire, My Tinnitus Therapy is incredibly effective at helping people decrease their experience of and discomfort with tinnitus.

In our clinics, treatment begins with an in depth evaluation by one of our specially trained providers. Once we know the cause and extent of your tinnitus, we will recommend one of the therapies we just discussed, or maybe even a combination of them.



Here's the thing you need to know and why you can congratulate yourself on choosing Timpanogos Hearing & Tinnitus for your treatment— we are the **ONLY** clinic with access to all three of these treatments. Any hearing clinic can prescribe hearing aids, but in Utah, Timpanogos Hearing & Tinnitus is currently the only full-time clinic trained and licensed to dispense the Lenire therapy. And because we developed it ourselves, My Tinnitus Therapy is **ONLY** available at one of our clinics.

An Important Consideration of Time



One important thing to realize is that, although occasionally people experience immediate relief of some or all of their tinnitus symptoms within days of beginning treatment, for most people it takes weeks, months or even a year to experience the relief they are seeking. Remember, it took a lifetime of cumulative harm to cause the auditory system damage causing your tinnitus. Be patient with your brain as it works hard to assimilate new stimulation to reduce your experience of ringing, whooshing, buzzing, or other sounds.

With all of these treatment options available, we find that over 80% of our patients experience less or even no tinnitus after 6-12 months, with many achieving desired results much sooner. As I mentioned previously, while there is no cure for tinnitus, following this progressive tinnitus management method is effective for most patients— with many seeing unexpected results of decreased cognitive load, increased scores on cognitive screening tools, better memory and more energy at the end of the day.

A Success Story

Because so many of our tinnitus patients come into our offices without hope after having been told that there was nothing that could be done about their tinnitus, I want to end this report with a success story.



Lynda came into our office recently and she had been suffering from tinnitus for over 50 years as the result of treatment she had been given for rheumatoid arthritis. Like so many of our patients, most of her health care professionals had told her there was nothing she could do and she should learn to live with it. Some had given her unproven and non-FDA recommended “treatment” suggestions ranging from vitamin supplements to dietary restrictions. Nothing worked.

After seeing an advertisement for our office, Lynda skeptically made an appointment. She watched our pre-appointment video and read our book and came in with not only a lot of questions, but with something she hadn’t had for years— hope.

We did extensive testing on her and explained the neurophysiological cause of her tinnitus and we recommended a course of treatment that included special hearing technology meant to give her brain the stimulation it

needed in order to reduce the experience of tinnitus.

Know what? It worked! Her experience of tinnitus we reduced almost immediately and since then, she has been able to live a much fuller, richer and happier life.

You can watch Lynda tell her own story by following the QR code below:



Next Steps

Now that you know a little more about what causes tinnitus, what triggers to watch for, and what treatment options are recommended, you may be wondering if you are a good candidate for treatment. Here are a few indicators that a tinnitus consultation might be a good option for you:

- You've had tinnitus for more than 6 months
- Your tinnitus causes you distress in your day-to-day life (trouble sleeping, concentrating or working)
- You have a hard time hearing others either because conversation isn't clear or because the tinnitus seems too loud.

If you are experiencing any of these symptoms, call the office most convenient for you and we will help you to set up a free consultation with one of our Certified Tinnitus Providers. You'll be glad you did!

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