Tinnitus is a perception of sound often described as a ringing, buzzing, or humming in the ear or head region. Usually, though not always, tinnitus is a symptom of hearing loss and affects millions of people in the United States alone. For some, tinnitus can be associated with depression, anxiety, sleep disturbances, interference with concentration; all which can be made worse by stress.

There are many potential causes of tinnitus including noise exposure, physical injury (e.g. head trauma, whiplash), ear disease, muscle spasms, circulatory changes, side-effects of medication, neural disease, and aging. A medical assessment is essential to determine potential causes and treatments. **However, in most cases the dominant cause of tinnitus is hearing loss, specifically damage to the inner ear. Tinnitus is not a disease itself, it is a side effect.**

Tinnitus can be very difficult to explain: 1) You are the only one that can “hear” your particular tinnitus, which can be even more difficult to explain to someone whom has never experienced tinnitus. This can be the source of much stress in a relationship when a spouse, sibling, child, or parent does not understand. 2) Your reaction to the tinnitus, is not necessarily the same that a friend or loved one may have experienced. 3) Your tinnitus may change, sometimes it may be louder, sometimes softer, sometimes a different pitch (i.e. lower bass-like frequency or higher treble-like frequency), there are probably even times you do not hear your tinnitus at all!
Here is the good news! We have learned a great deal about tinnitus over the past 20 years. It is very rare tinnitus is a sign of any impending disease or mean that you are going deaf (plus we will rule all those things out), usually it is just a side effect of hearing loss. Most importantly, **YOU DO NOT JUST HAVE TO LEARN TO LIVE WITH IT!** There are treatments that have been researched for years in the scientific literature and are very successful.

In the next few pages, we will review where tinnitus comes from and how we can treat the tinnitus using simple, but very effective methods.

**So what is the source of tinnitus?** As mentioned there are many potential causes, but the most likely is **hearing loss.** Getting older, exposure to loud sounds, certain medications, and genetics can contribute to hearing loss. Take a look at the figure to the right! Here we have the hearing system, aka the **auditory system.** In the normal hearing ear, sound enters the ear canal (external ear, #1 in picture) and puts into motion the eardrum and the tiny bones of the **middle ear** called, ossicles (#2 in picture). The middle ear bones then connect to the **inner ear** (i.e. cochlea, snail shaped, #3 in picture). If we opened the cochlea we would find rows of sensory cells (called **hair cells** due to the hair-like projections on their surface). The sound energy continues from the middle ear bones to the cochlea by generating a wave on the membrane that
the hair cells sit on. Where that wave peaks is related to the frequency (i.e. pitch) of the external sound. The cochlea is tuned, kind of like a piano. Nerve fibers (cochlear nerve, #4 in picture) connected to these hair cells then transmit that signal to the brain, through the brainstem and up to the auditory cortex (#6 in picture). So really we hear with our brain, the rest of the system is just transmitting the signal.

Hearing loss can be related to damage or obstruction in the external ear (example: plug of ear wax), middle ear (example: fluid behind the eardrum due to an ear infection), or the inner ear (example: damage to those hair cells due to noise exposure, aging, etc.). Tinnitus is usually related to the damage to the inner ear, which is the most common type of hearing loss, called sensorineural hearing loss. Hearing loss is usually gradual and can be insidious, meaning you may be unaware of it, or the damage may be only minor that it has limited affects on your daily life. For example, we can have damage to those hair cells, which accumulates over time from getting older, noise exposure, etc. While this gradual damage accumulates the central areas of our system change to try to compensate for the loss. This is where the tinnitus is created. Even mild hearing damage can result in tinnitus. It is a common misperception that the tinnitus is making it harder to hear. The tinnitus can be annoying and affect concentration, but has minimal impact on hearing. If you are having trouble hearing, it is because you probably have some degree of hearing loss. Even minimal levels of hearing loss can affect hearing, which may be most noticeable in noisy situations, like a restaurant.

How is hearing loss related to this tinnitus sound that I am constantly hearing?

An experiment was done all the way back in 1953 by two scientists, Heller and Bergman. What they did was take a bunch of college aged student with normal hearing and without tinnitus and placed them in a very quiet environment called an anechoic chamber and let them sit in
there for a while. They did nothing to the students, but when they retrieved the students, they asked them if they experienced anything? 93% of the students reported hearing a ringing, buzzing, or wooshing sound! **Tinnitus!**

**WHY?** The reason is probably simpler than you think. Our brain always expects to hear sound, unlike our eyes we were not born with ear-lids. In terms of early humankind this makes sense, we needed to always have an alarm for danger. If you were a caveman sleeping in your cave, based on your experience your brain was trained to identify danger with certain sounds, like footsteps or a low growl; so you wake immediately and can run, stay and fight, or play dead. This is of course refers to the old saying “fight or flight!” So, when we completely remove sound from an environment, our brain goes searching for sound and turns up its’ sensitivity. This can result in the brain beginning to pick up on spontaneous firing of nerves in our auditory system and perceives it as sound. There is spontaneous neural firing happening in our nervous system all the time, but normally the brain ignores this and only responds when there is a pattern due to external stimulation.

**Whenever you stimulate the auditory region of the brain it perceives sound.** For example, maybe you have seen a medical drama on TV, where the doctor is doing brain surgery and using an electrode to stimulate different areas of the brain, and the person smells something, or sees a color. Same thing applies to hearing! When we stimulate auditory regions of the brain we perceive sound, even if no external sound was played.

With hearing loss, there is damage to those sensory receptors (we call hair cells) and thus we begin to lose some of the input to the auditory region of our brain that was normally present. The auditory regions of our brain and brainstem want stimulation; when it stops receiving input, it adjusts so that it does get some input. So after the hearing loss our brain tries to compensate by changing. This is called **neural plasticity.** How does it change? It does few things 1) it may shift its
mapping slightly to focus on the parts of your cochlea that are still working, 2) it can turn up its sensitivity and try to pick up on what it is missing, 3) other things including increasing rate of firing, imbalance of excitatory and inhibitory inputs, involvement of non-auditory regions, and etc. The side effect of these neural changes is tinnitus! Due to the damaged hair cells or peripheral neural damage, our auditory brain region tries to compensate and begins picking up on a neural signal due to the change (i.e. plasticity), which is the tinnitus you hear.

I will give you another example. Say your hearing was equivalent to a radio broadcast in the city, loud and clear, now as you drive outside the city into the country, you start losing that signal (i.e. your hearing); you start to just hear the underlying static. That static is always there in some way, it is just covered up by the good signal in the city. That is why those college kids heard the tinnitus in the anechoic chamber; we took all sound out of the environment so all they heard was their own “static”. That is why when we have damaged hair cells, we are losing some of the normal incoming signal and we begin to pick up on the systems underling static (i.e. spontaneous neural firings).

Sometimes it helps to give a visual example. If you turn all the lights on in a room and shine a flashlight on the wall, you can see the flashlight, but not very well. If you turn off the lights, well the flashlight is very noticeable.
Advances in neuroimaging have been critical to our knowledge of brain regions involved in tinnitus. One way we have been able to do this is with patients that can significantly alter their tinnitus through movement, called somatic modulation. For example, they can change their tinnitus when they move their finger or shift their eyes a certain way. Now how does that happen? Well, like we have discussed tinnitus is a side effect of some sensory (i.e. hair cells of cochlea) and neural changes. Our brainstem is very compact with all kinds of nerves called cranial nerves. It is possible for them to start cross-communicating after some damage. For example, if you took a frayed electrical cord and plugged it in you can see some sparks. The nerves work the same way and those sparks can stimulate other surrounding nerves. So now a nerve that normally supplies someone’s little finger is now giving off a spark to the auditory nerve, which sends that message to the auditory region of the brain. The auditory region of the brain can’t tell that it is stimulation from the finger or coming from the ear, all it knows is when it is stimulated, that is sound, again tinnitus! This provides a within person control, in other words we can do imaging in the same person with their tinnitus on or off. On type of neuroimaging is functional magnetic resonance imaging (fMRI), which gives us a video of brain activity. When that person sits still (tinnitus off) we see normal brain activity, when they make the movement that turns on the tinnitus the auditory regions of the brain light up! Other areas light up too, which we will get too shortly!

So, How do we treat the tinnitus?

Well, as I just mentioned, those fMRI studies showed more than just the auditory region of the brain activated when a person is experiencing tinnitus. They also showed other parts of the brain, particularly the limbic system, and more specifically the amygdala. The amygdala’s primary role is in processing and memory of emotional reactions. Sounds can lead to many emotional feelings, such as a song you enjoyed in your youth that you have not heard in a while, your wedding song, or
the example I gave before about the caveman and the growl. The amygdala helps our brain determine the fight or flight response. The fact that this area is being activated by tinnitus underlies the negative reaction we can have to tinnitus. If the tinnitus comes out of nowhere or even slowly builds up, our first thought can be: is something wrong, am I going crazy, am I going deaf, do I have some disease, or just what the heck is this ringing! Since we don’t know and can’t stop it, we are stressed and our brain sees it as something negative and we attend to it. **This is why when you are stressed your tinnitus may seem worse.**

When our brain can’t figure out the source of the sound, it can respond by increasing attention to the stimulus of interest (another part of the brain prefrontal cortex), in this case tinnitus. Realize your brain is accustomed to sound being an external event. We don’t usually hear our underlying neural static. So this makes it difficult for the brain to reconcile the source and the meaning of the tinnitus. Usually, when we experience some type of unexplained event or symptom our brain tends to view it as a warning sign or that something is off or not right, aka something negative. For example, if you were driving your car and all of sudden started hearing a grinding sound from the engine, your first response would not be “oh what is this sound, this must mean my car is working even better!”. No, likely your response would be, “what is this sound, what is wrong with my car, and how much is this going to cost me”. However, your car was already making many many sounds, the difference was your brain viewed those sounds as normal engine noise. That being said, the new sound does not have to be a sign that the car is not working properly and could just be normal wear and tear. You notice it because it is new. You are concerned about it because you don’t know the source or the consequences.

Interestingly, our brain can have different reactions to sounds and even the same sound. Say you are in bed and have family visiting, outside your bedroom you hear the floor creak, your reaction is minor, “oh that
is just my aunt getting something to eat or drink”. Now say you are home alone and you hear that floor creak, now your reaction is completely different! The sound is the exact same, but the meaning changes depending on our knowledge of the unknown, that is the unknown source or potential danger.

How we treat the tinnitus is using methods to train your brain to recognize the tinnitus signal is not conveying important information, it is not a sign of danger and your brain does not need to focus on it anymore! The first step to this process is to understand what tinnitus is and what it is not.

You are not going crazy! You are having a normal reaction to a sound that your brain has not been expecting nor can interpret accurately and so it is being perceived as a warning. The good news is by the time you have got to us we will help rule out all of the dangerous sources. We will also request you see an otolaryngologist (ENT) to help rule out any medical causes. Tinnitus in most cases is a side effect of maladaptive neural plasticity in an attempt of the auditory system to compensate for peripheral damage, aka hearing loss. Regions along the brainstem and all the way up to the cortex increase activity to try to increase information to the brain, to sort of fill in the gap of the hearing loss. Tinnitus in most simple form is a sound, just without an external source. How the non-auditory regions of our brain (limbic system, basal ganglia, prefrontal cortex, etc.) react to the tinnitus determine if it is annoying, stressful, or meaningless.

Your brain is focused on this tinnitus signal it can’t figure out! Luckily, the brain is pretty amazing, just like the fact that it changed slightly and created the tinnitus, we can train it to ignore it. This process is called habituation. Understanding habituation is the second step in treating tinnitus.

The good news is your brain does it all the time. Though our brain loves stimulation it can only pay attention to a limited number of
things. For example, glasses, earrings, watch, rings, or even the shirt on your back, those different accessories are sending signals from your skin all day that those things are touching you, they are called **cutaneous receptors** that detect touch. However, through most of the day you don’t even notice them. Why? Because it is not an important signal for your brain to attend to, so it **habituates**, it stops responding. If you brain had to attend to every signal coming in at all times it would be very overwhelmed. This is what we will do with the tinnitus, we will train your brain to realize it is not a true sound and that it is not an important signal, it is simply a normal and common side effect of hearing loss.

Our brain also does this with sounds in our environment! For example, if you have a refrigerator or air conditioning at your home or office, you may notice it turn on during the day. After a while you stop noticing those sounds, they never went away, just our brain habituated to them because they were not conveying important information. My mother inherited an old grandfather clock when I was a kid and placed it right down the hall from my room. I could hear that clock all night and would keep me awake. However, after a few months I stopped noticing. The clock did not stop working, it just became part of the background. Perhaps you have some soft music playing at work, you are so concentrated on your work it falls into the background until maybe a song you like or do not like comes on, all of a sudden you notice the music again.

One final example and phenomenon similar to tinnitus is **phantom limb syndrome**. Phantom limb syndrome is when an amputee can feel pain in their toes or fingers, despite the fact they have lost that leg or arm! Why do they feel pain in their toes when they no longer have toes? Well, the part of their brain that responded to the toes is still working and wants stimulation (remember our brain likes to get input from our body). Now, the person no longer has that leg and no longer getting input from those toes it is used to getting. So it starts picking up on
other areas, such as the point where the leg was removed or spontaneous neural firings. However, this input is not what this region of the brain expects and does not know how to make sense of it, so it is perceives the input as a feeling from the toes (because that is the part of the brain being stimulated). A similar process has occurred with the damage to the hair cells of the cochlea and perception of the tinnitus.

There are several phases or levels of intervention that we can use to help train your brain to habituate to the tinnitus and greatly decrease your stress and eventually get you to the point where the tinnitus falls into the background, just like your ring, watch, or the air conditioning. If I tell you NOT to think of a number, what pops in your head? A number! So I can’t simply tell you, don’t think about your tinnitus. The idea is a relaxed control, where you attempt not to actively monitor your tinnitus, but let it be and let the treatments below take effect.

The third step for tinnitus treatment is applications of sound therapy. Silence is no longer your friend. In reality there is no such thing as silence there is always low level sounds around us. Numerous options exist for sound therapy, one is not necessarily more effective than the other, what is critical is consistency. The basic idea behind sound therapy is to play a soothing sound (via earphones, speakers in room, hearing aids with combo sound generator) at a level that does not mask the tinnitus (does not cover up completely), but at a level that reduces perception of tinnitus and provides relief, specific recommendations can be made on a case-by-case basis. The idea is the tinnitus is a constant sound that is perceived as aversive, to habituate, we must show the brain that a constant sound can be perceived as meaningless or even soothing. In addition, the stimulation provides a real external sound for the brain to disrupt attention to the tinnitus. Sound therapy can be very effective, but consistency is a key.

The fourth component of tinnitus treatment is distraction. Tinnitus is just a sound, however how our brain interprets this sound is
what leads to problems. Sometimes there is the feeling you can’t escape the tinnitus. In particular during times of stress and lack of stimulation we can become even more focused on the tinnitus. One way to help break that attention is through step 3, sound therapy. In addition, distraction can be very helpful. If you are having a rough episode with your tinnitus, don’t just sit there and listen to it. Put on the sound therapy and distract yourself and do something you enjoy. If you like to cook in the kitchen, go cook something. If you like to go for a walk, go for a walk. If you like to work in the garage, go work in the garage. Call up a friend, put your favorite funny movie on, something to distract your focus.

Finally step 5 is diet, exercise, lifestyle, and mental health. Poor general health, sedentary lifestyle, poor diet, and inadequate sleep can all exacerbate tinnitus. Many medications used to treat effects of unhealthy lifestyles can actually cause tinnitus. Let tinnitus be an alarm, maybe even a wake-up call to take care of you and get healthy! Getting into shape may not cure your tinnitus, but it can reduce stress, improve sleep, allow you to stop taking certain medications that do significantly influence tinnitus. If you have significant stress in your life, anxiety, depression either related to the tinnitus or not, therapy can be helpful. As we discussed stress can exacerbate tinnitus. Cognitive behavioral therapy (CBT) is a therapeutic approach that helps a patient identify maladaptive thoughts and behaviors and learn stress reduction techniques. CBT can be very beneficial for tinnitus patients and should be considered by all patients. Before starting any diet or exercise program consult your primary care provider.

Some review and tips/strategies:

1. Counseling and knowledge of the sources of tinnitus. You just started this step and have now prepared yourself and your brain to realize there is help. Tinnitus is simply a side effect of some auditory damage or neural damage related to injury, it is not
a disease or indication that you are going deaf, crazy, or have a life threatening disease. However, it can cause significant impact on a person.

2. **Understanding Habituation.** Your brain habituates to stimuli every moment of the day it can do the same with tinnitus, we just need to convince the brain it is not a meaningful signal.

3. **Environmental Sounds.** We will have you purchase environmental sound generators, you can find these at department stores or online. They will play sounds like “rain”, “waterfall”, “ocean”, etc. The important thing is the sound is constant, relaxing, but does not have any meaning, so you are not paying attention to it. You should have this sound playing in the background of your home or office. This types of sound files can also be found online and played through your computer. You can use earphones too, if so be sure not to turn on too loud keep at a level where it mixes with the tinnitus. This will allow your brain to recognize a constant real sound versus the not real sound tinnitus and it will begin to habituate to both. If you cover up the tinnitus your brain cannot habituate to what it can’t perceive. This can also help reduce your tinnitus when you are trying to go to sleep. Many sounds can be found online through a simple google search and downloaded. You can also go to [www.ata.org/sound](http://www.ata.org/sound) and make sounds to download for free. HAVE THIS SOUND PLAYING AS MUCH OF THE DAY AS POSSIBLE INCLUDING WHEN YOU SLEEP. It should just be constant noise in the background. Silence is not your friend.

4. **Sleep is very important,** it is crucial that you are well rested, to help reduce stress; stress can affect your tinnitus (remember the fight or flight response). Avoid silence! Keep your environment enriched with soft relaxing sound! Check out the sound pillow at [www.soundpillow.com](http://www.soundpillow.com). You can also ask your primary care if you can try melatonin, an over the counter sleep agent.
5. **MP3 Player/Ipod/CD player.** If you want to have access to sound while you are on the go or that does not need to be heard by others, you can download sounds or purchase CD’s; for example “white noise”, “pink noise”, “ocean”, etc. Some smartphones also have apps to perform this function. Again listen to the soft relaxing sound at the level where it mixes with your tinnitus. A website you can checkout is www.simplynoise.com, they also have a smartphone app. Many sounds can be found online through a simple google search and downloaded. You can also go to [www.ata.org/sound](http://www.ata.org/sound) and make sounds to download for free. There are also ear level sound generators that can be purchased that look like hearing aids, but do not amplify sound, just provide a constant noise.

6. **Hearing Aids.** If you have been identified with a hearing loss, we can help use hearing aids to fill in those areas where you are missing sounds and retrain the brain to again focus on real environmental sounds over the tinnitus. Plus, if you are having difficulty hearing and having to strain to hear, that is making you more susceptible to paying attention to your tinnitus. Hearing aids can help reduce some of your listening effort and provide your auditory system with enriched input. Hearing aids, if you have hearing loss and tinnitus, often make a significant difference in treating the hearing loss and tinnitus. If you had a broken arm would you simply take aspirin to treat the pain, or would you get a cast to treat the broken arm and also take aspirin to treat the pain?

7. **Hearing Protection.** Protect your ears when you are in a loud environment, like a concert, using power tools, etc. These loud sounds can damage your hearing and affect your tinnitus. However, do not wear hearing protection around when it is moderately loud or quiet, remember we are trying to stimulate your brain with real constant sound.
8. **Lifestyle.** Try not to let the tinnitus control your life, you control your life. If there are activities you are no longer participating in because of the tinnitus, you can feel free to do those things again and enjoy life again. You can still go to concerts, play music, etc, but just use hearing protection (again only around loud sounds). *Other tips are living healthy; we encourage you to eat a balanced healthy diet and exercise. However, before starting any exercise or diet program please consult with your primary care physician.*

9. **The Internet and Research.** Avoid doing your own research, including the internet, the internet can be filled with all kinds of misinformation. We are here to keep you updated on the latest advances. Let the sound treatment do its job, if you continually monitor and research the tinnitus, you may delay the habituation process. One website I do recommend is [http://www.ata.org](http://www.ata.org). The American Tinnitus Association. For example, under the Patients, Families, and Friends section you can find sound files of tinnitus sounds, so other family members may be aware of what you are hearing. Another good website is the Tinnitus Retraining Therapy website that has further tips and exercises, [www.tinnitus.org](http://www.tinnitus.org) and the Tinnitus Activities Treatment site [http://www.medicine.uiowa.edu/oto/research/tinnitus/](http://www.medicine.uiowa.edu/oto/research/tinnitus/)

10. **Subsequent Treatment.** Other treatments can also help that also utilize variations of sound treatment to stimulate the brain and diminish perception of the tinnitus. We can explore these after you have tried the above. These include ear level sound generators, neuromonics, soundcure, and etc. These are all variations of sound therapy.

11. **Distraction.** Try not to let the tinnitus be a central part of your life or give it power it does not have. If you are constantly talking about the tinnitus and making it a daily focus, guess what you will notice it more, because you are bringing it to the attention of your brain. When you are having a rough day with tinnitus, distract yourself. Take that negative experience and turn it into
a positive. Get up, put on some sound (radio, tv, headphones), go for a walk with sound, play with the dog or cat, do something in the yard, take a shower, exercise; get your mind off the tinnitus. If you are in bed, turn on some different sound (fan with sound generator), move to another room, turn tv on for a little while on a show you like. Get your brains focus off the tinnitus!

Throughout the day you will find there are times you do not notice your tinnitus. You are distracted, there is sound around, or you are out enjoying yourself and you will catch yourself going “where is my tinnitus”. Then you listen for it and there it is! Here is the positive, you just went seconds, minutes, or hours without noticing your tinnitus. Now it did not go away, that signal was still there in the background, but your brain was not paying attention to it. That is your brain habituating! By using the methods suggested here we can get your brain to notice the signal less and less until it becomes like that ring on your finger or watch on wrist or earrings in your ear, just another meaningless signal that has become part of you. For example, you breath all day. You make sounds when you are breathing. How often do you listen to yourself breath?

12. **Tinnitus Myths.**  

A. Tinnitus reduces your hearing or mask your ability to hear. Tinnitus is a common side effect of hearing loss. It is common that patients think if it was not for the tinnitus they would have normal hearing. This is not true. Tinnitus can be distracting, but will have minimal impact on your ability to hear.  

B. Tinnitus is coming from your ears. Though often it can seem that way. Tinnitus is a neural event happening somewhere in the auditory pathway, the perception of the tinnitus signal though requires your brain to interpret that signal and pay attention to it. Multiple regions of the brain are involved in this process. You cannot simply cut the auditory nerve and stop tinnitus or try to destroy that ear and stop tinnitus, this would likely have no change or make your tinnitus worse.  

C. “You
just have to learn to live with it”. This is not true at all. The understanding of source, use of sound therapy recommendations, adjunctive counseling, distraction, positive thinking, living healthy, sleep hygiene all can help facilitate your brain to habituate to the tinnitus. This is not simply passively learning to live with it, this is actively training your brain to recognize the tinnitus is a meaningless signal and that it does not need to focus on it.

13. Hyperacusis and Sound Sensitivity. It is common for persons with tinnitus to have sensitivity to sound. This is often related to hearing loss, but can be due to underlying medical conditions such as facial nerve dysfunction, Lyme disease, William’s syndrome, etc. If you are primarily only sensitive to loud sounds, this is not consistent with true hyperacusis, but what we call recruitment. Recruitment refers to the constricted growth of loudness for someone with hearing loss. If sound becomes loud for the average person at 100 dB and normal hearing persons hear that sound at 0 dB, they have a 100 dB of growth. A person with hearing loss may not hear that sound until 50 dB, so the growth is reduced by 50 %, so sound goes from just being audible to being loud very quickly. Hyperacusis is sensitivity to everyday and moderate level sounds. A common reaction to sound sensitivity is to reduce exposure to those sounds or to use hearing protection. This may provide temporary relief, but will in the long run exacerbate the situation. If you are always wearing hearing protection, that makes your brain turn up its sensitivity to try to hear over the hearing protection. Now when you take out the hearing protection things will sound even louder. Hearing protection should be reserved only for loud noise exposure (see number 6). A variation of sound sensitivity is misophonia or soft sound sensitivity syndrome. Misophonia is sensitivity to a specific sound, e.g. vacuum or nails on a chalkboard. Soft sound sensitivity syndrome (S4) a form of
misophonia is sensitivity usually related to mouth sounds, e.g. chewing, gum smacking, breathing, slurping. The use of sound therapy is also effective for hyperacusis and these variants. However, the goal is to desensitize the system. Meaning, we can use constant sound starting at a low level and gradually increase over time until the brain recalibrates its sensitivity, this is very effective for hyperacusis. With specific sounds, such as misophonia and S4 you can use pleasant sounds (e.g. favorite music) to mix with the offending sound to reduce perception, this pleasant sound would then be reduced over time to reveal more of the trigger sound. Another approach is to introduce the trigger sound at low levels using a recording and gradually increase level and duration of exposure until patient minimizes their reaction to the sound. A third approach is to associate positive activities with the trigger sound. Adjunctive counseling to reduce response to trigger sounds is usually needed as usually misophonia and S4 are not usually related to auditory pathology, but abnormal response to sounds.

Other Counseling. It is very common for us to work with other professional counselors to further explore techniques to help diminish stress and tinnitus. Other stressors in your life can make the tinnitus more difficult, it can be very beneficial to work on reducing these stressors with other experts that we collaborate with commonly. Cognitive Behavioral Therapy (CBT) can be a great adjunct to helping patients deal with stress, anxiety, depression, and negative thinking. BE POSITIVE. The brain can learn to find these sounds to be less meaningful.

SUMMARY
1. Tinnitus is a normal side effect of hearing loss or neural injury, it is not a disease nor a sign that you are going deaf or crazy;
2. Even normal hearing people, whom have never experienced tinnitus, do so when all sound is removed from an environment;
3. There are effective treatments to help reduce your tinnitus;
4. Your brain can learn to habituate to the tinnitus, just like it does with a million other stimuli;
5. First we need to break your brains negative view of the tinnitus and use real sound to help differentiate from the tinnitus signal;
6. Avoid silence, and surround yourself with relaxing sounds
7. Try to get good quality sleep time, exercise, and eat healthy foods, all of these will improve your brains ability to habituate and make you healthier
8. Only use hearing protection if you are around loud sounds (examples: concert, power tools, hunting); never in quiet or moderately loud situations (examples: home in quiet, average restaurant, driving car).
9. Try NOT to monitor your tinnitus, research online, or let the tinnitus control you! Have a relaxed control approach; let the treatment and your brain do its job. There will be times when the tinnitus is loud or that you don’t not even notice it, don’t use this to gauge if the treatment is working. It is common for the tinnitus to change in quality. The LESS you monitor it and consciously engage it, the LESS and LESS you will be aware of it, allow the tinnitus to fall into the background and let the treatment take it there.