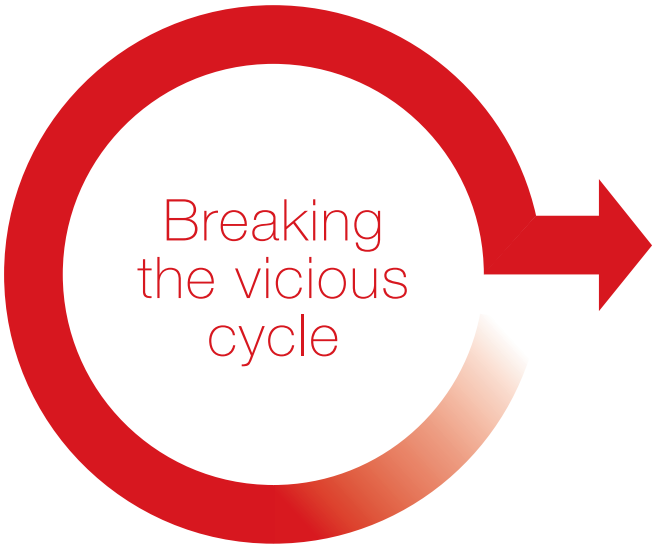
Tinnitus Handbook



ReSound

rediscover hearing

Tinnitus Handbook

This ReSound Tinnitus Handbook is designed to provide valuable information to those suffering from tinnitus. It will help you better understand your tinnitus, and what can be done to assist you in finding some relief. If you have any questions, we strongly recommend that you contact a hearing care professional who is qualified and experienced in tinnitus management.

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What is tinnitus?

Tinnitus is a problem that approximately 10-15% of the population reports experiencing on a regular basis. About a quarter of these suffer to a degree of tinnitus severe enough to seek medical attention. These numbers are likely to increase since tinnitus affects about one third of the population over age 65, and in industrial countries, noise pollutants and life span are increasing.

There are many different types of tinnitus. Tinnitus can vary in the way it sounds, its severity, as well as its annoyance. It is most commonly referred to as “ringing in the brain”. Individuals have reported anything from intermittent episodes that are not very bothersome to a constant noise that can negatively influence one’s daily life. Tinnitus takes many different forms; for example, a ringing or chirping, “whooshing” or clicking sounds. It can occur a few times a month or many times in one day. It can last for a few moments or several hours, or it can be constant without relief - even while people sleep. For some, tinnitus has a pulsating or repetitive pattern.

Tinnitus is generally accepted to have three defining characteristics. First, tinnitus is a perception of sound and therefore it must be audible to the patient. Second, it is involuntary and cannot be produced intentionally. Third, it must originate inside the head.

You are not alone

Tinnitus is actually heard by most people at some point in their lives, even those with normal hearing. It can be a by-product of loud noise exposure, such as a rock concert or a night out at a club, disappearing after a few hours or the morning after. It can also happen spontaneously without any reason, and then disappear as suddenly as it began. Many professionals believe this is just a function of the normal hearing system.

However, when tinnitus starts to negatively affect one’s life and impact on day-to-day functioning, it is necessary to seek medical attention.

Figure 1

10-15% of the population report experiencing tinnitus.

3% suffer tinnitus to a degree severe enough to seek medical attention.

What causes tinnitus?

There are many neurophysiological theories on the causes of tinnitus and site of origin. No one theory has been definitively proven, but some have been studied more than others. The intention of this handbook is not to review all the theories and models, but rather to discuss one of the more generally accepted models of the origin of tinnitus. We have listed many good references and websites at the back of the handbook that discuss them in detail.

In addition to the neurophysiological factors, there can also be psychological influences that play a role in the perception of tinnitus. It is important to consider both of these aspects when trying to find relief from your tinnitus.

One model of tinnitus generation

A well-accepted theory on tinnitus generation is that of spontaneous activity in the hearing system. This activity can even take place in the absence of sound being heard. Some experts believe that damage to hair cells in the cochlea (inner ear) can help cause tinnitus.

The cochlea consists of two types of hair cells: Outer hair cells and inner hair cells. Hair cells are responsible for helping us hear and then transmitting what we hear to the brain to be processed into meaning. Inner hair cells, rather than outer hair cells, are primarily responsible for sending what we hear to the brain, although outer hair cells do play a role in this process. Because of their location, outer hair cells are more exposed and are often damaged before inner hair cells.

When the outer hair cells are damaged, they are unable to carry out their normal function. Part of their responsibility is to prevent the inner hair cells from sending sound signals to the brain when there is no sound to be heard. As a result, inner hair cells can spontaneously transmit signals to the brain that are amplified, or made louder, by the hearing system. The amplified sound can result in a perceived “ringing” sensation known as tinnitus, and is illustrated in Figure 2.

Furthermore, the way someone experiences tinnitus, and the amount of attention they pay to it, varies from person to person. If it is ignored, the tinnitus takes low priority and “blends” into the background. If it is prioritized, the tinnitus can increasingly become a focal point for the patient. If this continues for an extended period of time, the brain will learn to focus on the tinnitus, even when other background sounds are present.

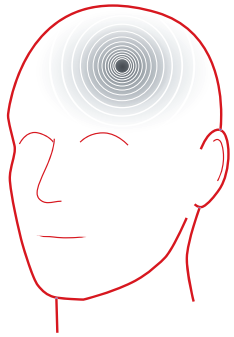

Figure 2

It is believed that tinnitus is amplified spontaneous neural activity, resulting in a “ringing in the brain”.

The vicious cycle

The vicious cycle

Continual tinnitus can cause anxiety and stress in many individuals. Once this negative connection is established, a cycle can begin that affects other regions of the brain, including the limbic system (which is involved in processing emotions) and the autonomic nervous system (physical/bodily reactions). This is commonly known as the vicious cycle (Figure 3). When tinnitus is perceived, it can prompt a number of emotions, including fear, danger, unhappiness, etc. These can in turn cause physical reactions such as anxiety and stress, thus reinforcing the tinnitus and making the cycle repeat itself.

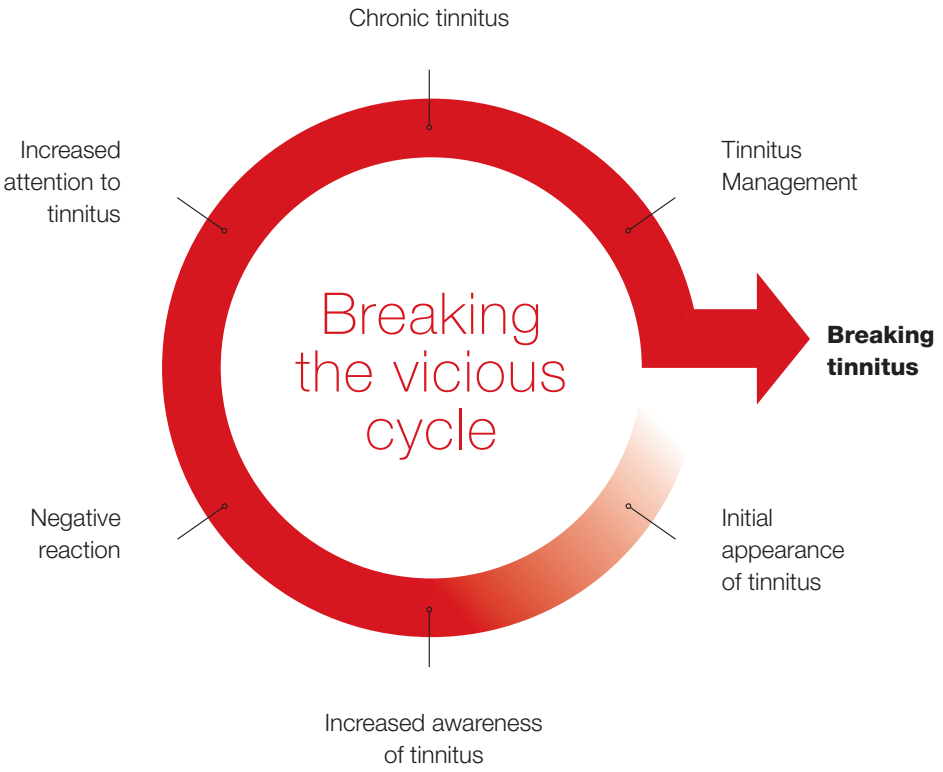

Figure 3

The vicious cycle

The wrong focus

Some noises – like a rattle in a new car or a baby crying – attract one's attention, sometimes for good reason, sometimes for bad.

Is tinnitus real, and does it mean there is something wrong with me?

Tinnitus is very real, as it is a "sound" that is heard by the person experiencing it (subjective tinnitus), regardless of whether someone else can hear it (objective tinnitus). In fact, in MRI scans, magnetic imaging shows cerebral activity associated with auditory perception.

Tinnitus should always be thought of as a symptom and not a disease – just as arm pain could be a symptom of an underlying fracture. And since tinnitus can be a sign of certain medical complications, it should never be dismissed or underestimated.

Although most cases of tinnitus are harmless and simply a by-product of a damaged hearing system, you should see a hearing care professional under any of the following circumstances:

- you have persistent tinnitus
- your tinnitus is only heard in one ear
- your tinnitus is accompanied by dizziness and/or balance problems
- Tinnitus is affecting your day to day functioning

Can my tinnitus be cured?

In certain instances where the origin of tinnitus is known, for example, dietary habits and side effects of medication, proper management can help reduce and, sometimes, eliminate the tinnitus.

For most tinnitus patients, there is no known cure, but there are many treatment options available to help you understand your tinnitus better and provide relief.

There are many advertisements claiming that ginkgo biloba, vitamins, herbs, etc. can provide relief or even eliminate tinnitus. It is important to note that there is little proof to these claims, and before trying any of them you should consult a hearing care professional, who is trained and experienced in treating tinnitus patients.

An experienced hearing care professional can inform you about what treatment options are available. Because tinnitus is unique from person to person, it is important to find a treatment plan that is individualized for your personal needs and works best for you.

Who should I consult regarding my tinnitus, and what can they do for me?

It is strongly recommended that you start with a hearing care professional who is trained and experienced in treating tinnitus patients. These professionals usually have in-depth training on different treatment options and will thoroughly discuss your tinnitus problems with you.

The aim of the first consultation is to better understand the history of your tinnitus and can include discussions regarding the onset, traumatic events that may have induced the tinnitus, how bothersome your tinnitus is, characteristics of the tinnitus and how the tinnitus is affecting you.

It is important that you go in depth on these issues as this will help them to identify the direction best suited for treating your tinnitus. In addition to a consultation, many tinnitus experts will ask you to fill out a questionnaire in order to more clearly understand how your tinnitus is affecting you.

Hearing tests

There are some audiological (hearing-related) tests that may be administered to provide more information regarding how your tinnitus sounds to you. For example, tests might shed light on the pitch of your tinnitus and how loud you perceive it. The test results can later be compared with other results during the treatment process, and help monitor the status of your tinnitus over time.

Help from a network of professionals

In addition to hearing care professionals, many other professionals can be of assistance. Specialists, such as Ear, Nose and Throat doctors (ENTs), otolaryngologists or otologists can rule out any medical complications that could cause or contribute to your tinnitus. Family doctors or General Practitioners (GPs) can assist in providing information regarding medications and a general medical history that may be useful in understanding your tinnitus better.

A psychologist and/or psychiatrist may be involved in the treatment plan as well, depending on your needs. They often help in more severe cases where the tinnitus is unbearable by providing counseling and support that may be beyond the scope of a hearing care professional.

As some studies have shown that high doses of sodium or caffeine can increase the loudness level in some cases of tinnitus, consulting a dietician may be helpful. And because stress can aggravate tinnitus, some tinnitus experts may refer you to massage therapists to help you to relax.

A network of professionals working together to help you find relief from your tinnitus can be very effective, as each discipline offers unique expertise and knowledge to facilitate the treatment process.

What treatment options are available?

There are a number of treatment options available, each offering different explanations for how they can be beneficial to someone suffering from tinnitus. It is not our intention to recommend a preferred method, as different treatment plans may be more suitable for particular cases of tinnitus. It is, however, important to consider your individual needs and expectations when selecting the appropriate type of treatment plan.

One of the more well-known treatment plans is Sound Therapy, where the use of a tinnitus sound generating (TSG) device is the focal point, and simply involves the introduction of sound in connection with tinnitus treatment. In addition to a TSG device, other sound generators, such as sound pillows, radios, TV, etc. can be used to help relieve the negative effects of tinnitus (Figure 4).

Lastly, with the advancements in hearing instrument technology, wireless streaming devices can be incorporated to truly personalize a sound therapy plan.

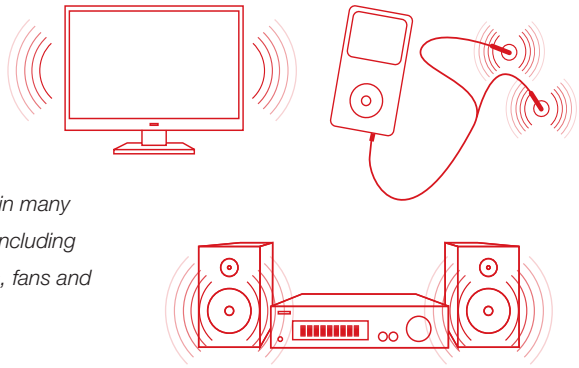

Figure 4

Sound Therapy can be introduced in many ways by means of everyday items including TVs, radios, portable music players, fans and table-top sound generators.

Sound Therapy

With Sound Therapy, the TSG device is set at a volume at which the tinnitus is partially covered by the sound generated by the TSG device. This helps reduce the perceived strength of the tinnitus signal by introducing background noise, making it more difficult to separate the tinnitus from the background noise (Figure 5). The goal being that the tinnitus signal is reduced by the noise generated from the TSG, making detection of the tinnitus by the brain more difficult. Over time, less importance and priority is placed on the tinnitus as the brain becomes habituated to it. And thus relief is achieved.

Tinnitus Retraining Therapy

Another well-known treatment plan is Tinnitus Retraining Therapy (TRT). In TRT, emphasis is placed on education, and how the brain is involved in the perception of tinnitus, as previously discussed. This can help you to better understand where tinnitus comes from, as well as to understand the reactions produced by other mechanisms in the body in response to the tinnitus. The goal of TRT is to gain knowledge and understanding of your tinnitus, and for you to have more control over your emotions and reactions to the tinnitus. Ultimately, you will place less importance and priority on the tinnitus which, in turn, will help you cope with the tinnitus more effectively. Sound Therapy is a vital component of TRT, providing a combined solution to tinnitus treatment.

What treatment options are available?

In addition to Sound Therapy and TRT, there is Progressive Tinnitus Management (PTM). PTM is similar to TRT regarding education, but uses a 5-step hierarchal approach that addresses the needs for different levels of tinnitus. PTM strongly emphasizes the use of sound, in combination to counseling. It also highlights how unique tinnitus can be to each person, and believes in using solutions most preferred by the patient. There are also psychological models of treatment, however It is outside the scope of this handbook to discuss the variety of models available, but often a psychological approach can be used in conjunction with other types of treatment, when appropriate.

New approaches to tinnitus management are surfacing all the time. It is, however, important to separate management plans that make unproven claims from those that are based on evidence-based practice.

The goal of all treatment plans is essentially the same, to break the vicious cycle, and the negativity associated with the tinnitus. As with any treatment plan, it should be understood that results take time. Some immediate relief may be achieved, but ultimately the goal is to become more comfortable with the tinnitus, realize it is not life-threatening and, most importantly, that you are in control of your responses to it.

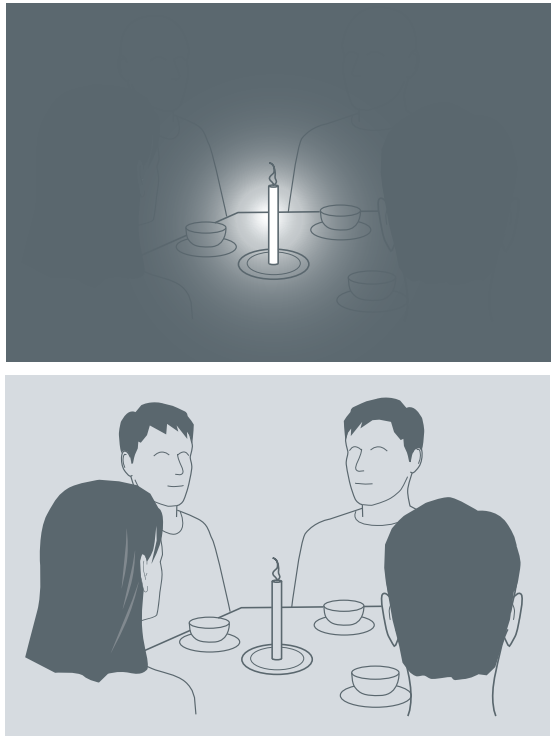

Figure 5

The contrast between a candle in a dark room and its background environment make the candle an easily detectable focal point. The same candle in a well-lit, busy room blends into the background and is harder to detect. The aim of Sound Therapy is to teach the brain to reclassify tinnitus as an unimportant sound that blends into the background.

What is a tinnitus sound generator (TSG)?

A tinnitus sound generator is a device like a hearing aid that delivers sound to the ear to help “cover up” the perceived tinnitus. TSG products come in a variety of shapes and sizes, including devices that sit over the ear, called behind-the-ear (BTE) hearing aids, as well as custom-made options that are designed to only fit the unique contours of your ear. Just as hearing aid technology has improved over the years, so has the TSG technology available today.

In addition, some newer technology allows you to modify the noise generated by the device to provide more individualized, comfortable settings for your particular needs. Some specialized TSG products even offer a soothing “ocean wave” sound (think of waves rolling in and out) that can be more relaxing than the traditional “‘white” noise generated by previous versions of TSG products. Some TSG products even have automatic functions, which further help distract your attention on the tinnitus by reducing interaction with the hearing aid, making it easier for you to get on with your daily activities without having to “fiddle” with controls on the device.

Combination hearing devices

Should you also have a hearing loss that needs to be treated, there are advanced options called combination devices. Combination devices offer you the unique flexibility of having a Tinnitus Sound Generator (TSG) and hearing aid all in the same compact package (Figure 6). This provides the flexibility and convenience you and the hearing care professional may be looking for, since you do not need separate devices to treat two issues. There are different levels of technology available for combination devices, depending on what your particular needs are. Talk to your hearing care professional about what options may be most appropriate for you.

It is important to remember that TSGs and combination devices are not cures. They are tools to be used in conjunction with an individualized treatment plan and good counseling. TSG and combination devices can be very effective when used appropriately, and with the right treatment plan.

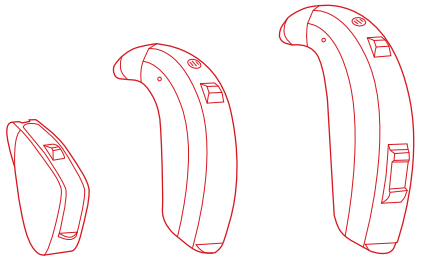

Figure 6

Examples of combination devices.

Will I always have to use the TSG?

As mentioned before, tinnitus rehabilitation takes time. Remember, tinnitus itself does not cause harm, but rather it is your response to the tinnitus that can affect your life. Learning to cope with your tinnitus is a process, and should be delicately handled and treated over a period of time.

Some people find immediate relief when using a TSG or combination device, reporting that the device helps take the edge off the tinnitus. For others, it takes longer.

As reviewed earlier, the goal of a TSG or combination device is to decrease the perceived strength of the tinnitus signal by partially "covering up" the tinnitus with the noise generated by the device. This way, the tinnitus gets filtered out at the sub-cortical level, just like unimportant daily sounds like the humming of a fridge.

When tinnitus sounds get filtered out rather than escalated, it is known as habituation.

Habituation takes time

Over time, it is expected that habituation to the tinnitus will occur, and subsequently you can learn to live comfortably with tinnitus. Studies have shown that for some TSG and combination devices, it can take 6-24 months for complete habituation to take place and maximum benefit to be achieved. Some individuals may require more time for complete habituation to occur. Again, it is very important to understand what works best for you and to work with the recommended suggestions of the hearing care professional while using a particular TSG or combination device.

Is there anything I can do to help reduce my tinnitus?

For most individuals there are no quick fixes to tinnitus, but there are some lifestyle changes you can make to help you manage your tinnitus better. Here are some recommended tips that may be helpful:

Good dietary and lifestyle habits

For some, reducing consumption of sodium and caffeine may help diminish the perceived strength of the tinnitus signal. In addition, the overall benefits of moderate exercise can aid in stress reduction, general health, sleep patterns, etc.

Keep busy

By occupying your time with a variety of enjoyable activities and engaging in tasks that require attention, less time may be spent focusing on the tinnitus.

Avoid complete silence

By adding some light background noise (e.g. music, TV), the strength of the tinnitus signal will be reduced against the introduced background noise. This can also be useful during quiet times or when trying to fall asleep.

Wear hearing protection only when needed

Inappropriate use of hearing protection can increase the sensitivity of the hearing system, making you more aware of your tinnitus. Hearing protection should only be used when exposed to hazardous levels of noise that could damage hearing and potentially make the tinnitus worse. Hazardous levels of noise can damage and even destroy the hair cells in the inner ear. Greater damage to hair cells could intensify the tinnitus.

If there is no cure, what defines successful tinnitus treatment?

Success can be defined in many ways. As there is no known cure for tinnitus, any expectation of completely eliminating the tinnitus is most likely unrealistic. Therefore, you and the hearing care professional should only set goals that are realistic and achievable.

To some, being able to provide any relief from tinnitus could be considered a success. Being able to perform daily activities without the stress and annoyance of tinnitus on a constant basis would be a great relief. Overall, most treatment plans agree that habituating to the tinnitus is the ultimate goal. Habituating means that you will learn to accept and cope with your tinnitus, giving it less importance and lower priority, allowing more freedom to focus on more important matters in life.

Measuring your progress

As discussed previously, there are questionnaires that can help quantitatively measure the progress of tinnitus treatment.

Typically, these are given when you first visit the hearing care professional, providing baseline data on your initial reactions to the tinnitus, and these tests can be given throughout treatment to measure the progress of your treatment plan.

The most important thing to remember is to start by finding a hearing care professional that is trained and experienced in treating tinnitus patients. Together you can discuss what your treatment options are and then decide what the best plan of action is for your particular needs.

Remain positive

Last, but not least, always remain positive. Severe tinnitus is extremely difficult to live with, but there are professionals out there that can help you. Together you can find a successful solution.

Informational references

American Tinnitus Association
www.ata.org

British Tinnitus Association
http://www.tinnitus.org.uk

New Zealand Tinnitus Association
www.tinnitus.org.nz

United States National Library of Medicine
National Institutes of Health
www.nlm.nih.gov/medlineplus/tinnitus.html

Tinnitus Retraining Therapy
www.tinnitus.org

Tinnitus Research Initiative
www.tinnitusresearch.org

Oregon Tinnitus and Hyperacusis Treatment Center, Inc
www.tinnitus-audiology.com

University of Iowa Health Care: Tinnitus Clinic
www.uihealthcare.com/depts/med/otolaryngology/clinics/tinnitus/index.html

Tinnitus Practitioners Association (TPA)
www.tinnituspractitioners.com

Notes

Notes

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ReSound® provides excellent sound by offering innovative hearing solutions that combine original thinking and design with solid technology – all based on deep audiological insight and a profound understanding of the hearing impaired.
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MK603865Rev.A 07.2013