

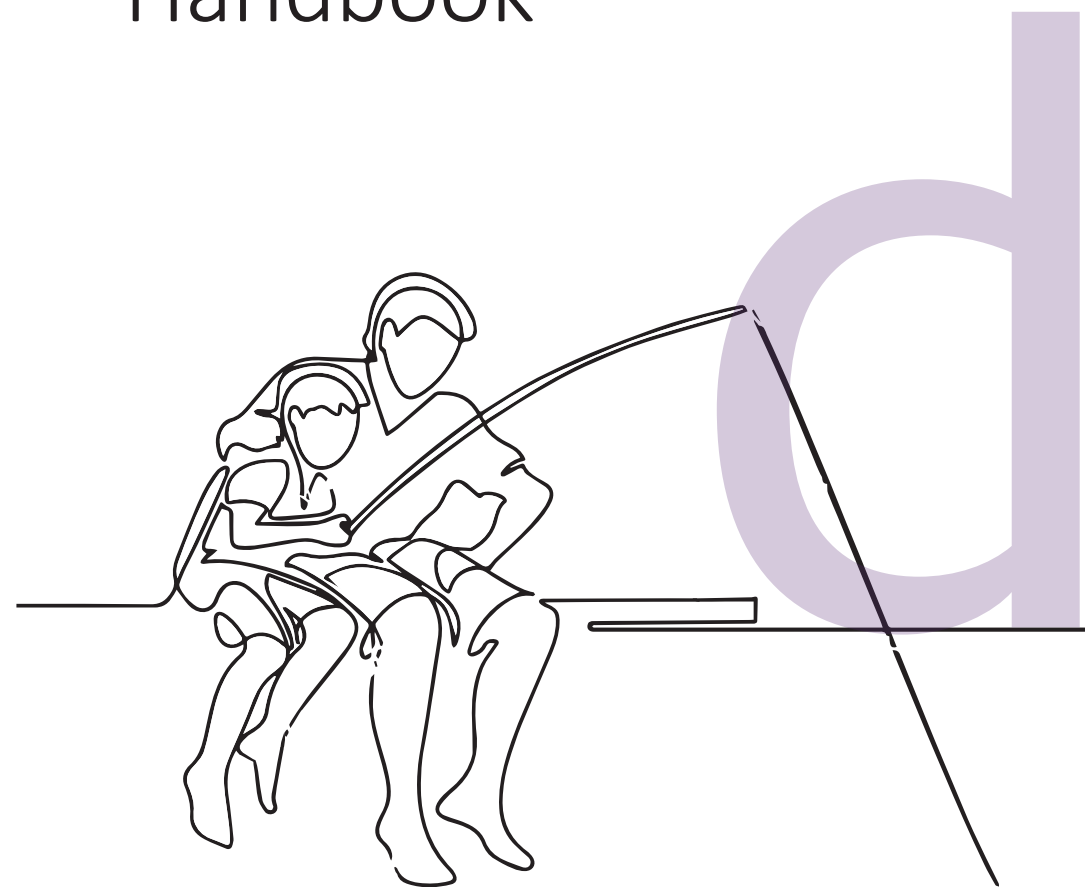
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# Tinnitus Handbook



## Tinnitus Handbook

This Tinnitus Handbook is designed to provide valuable information to those experiencing 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 sensation that approximately 10-15% of the population report experiencing on a regular basis. About a quarter of people who experience tinnitus go on to seek advice from a Healthcare Professional.

Tinnitus is most commonly referred to as “ringing in the ears”, however it can be almost any sound, for example, chirping, ringing, whooshing, clicking or a pulsing sensation. Tinnitus 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.

Tinnitus is generally accepted to have three defining characteristics.

First, tinnitus is a perception of sound and therefore it must be audible to the individual only.

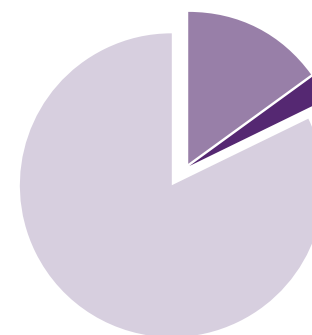
Second, it is involuntary and cannot be produced intentionally.

Third, it must originate inside the head.

## You are not alone

Tinnitus is actually heard by most people at some point in their lives. 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 individuals believe this is just a function of the normal hearing system.

However, if your tinnitus starts to impact on your day to day life it would be advisable to seek advice from a Healthcare Professional.



**Figure 1**

- 10-15% of the population report experiencing tinnitus.
- 3% of people experiencing tinnitus seek advice from a healthcare professional

# What causes tinnitus?

There are many neurophysiological theories on the causes of tinnitus, however 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 contribute to the cause of 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. 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.

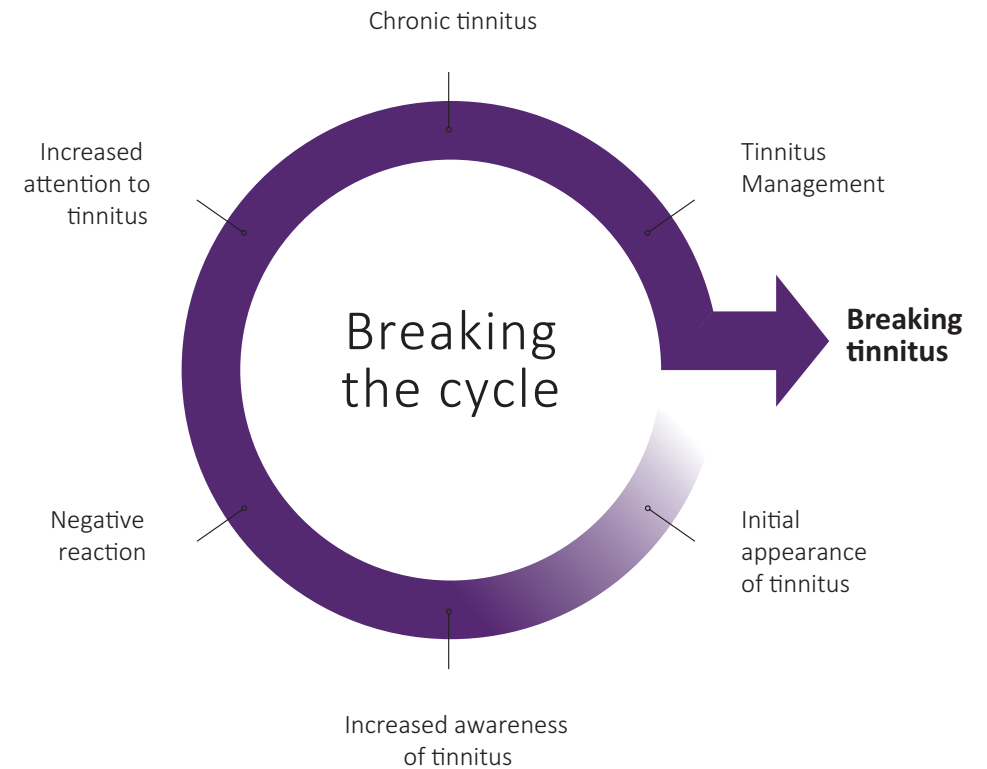
Due to their location, outer hair cells are more exposed and are often damaged before inner hair cells. When the outer hair cells are damaged, they are unable to carry out their normal function. Part of their responsibility is to prevent the inner hair cells from sending sound signals to the brain when 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. Furthermore, the way a person experiences tinnitus, and the amount of attention paid to it, varies from person to person. If it is ignored, the tinnitus takes a low priority and it “blends” into the background. If it is prioritised, the tinnitus can increasingly become a focal point for you and 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.

# The cycle

Continual tinnitus can cause anxiety and stress in some 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), see (Figure 2).

When tinnitus is perceived, it can prompt several 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 2**  
The cycle

# 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, regardless of whether anyone else can hear it.

Most cases of tinnitus are harmless and simply a by-product of the hearing system, however you should see your GP in any of these circumstances to ensure your tinnitus is not being caused by an underlying medical condition:

- you have persistent tinnitus
- your tinnitus is only heard in one ear
- your tinnitus is accompanied by dizziness and/or balance problems
- your tinnitus is pulsatile in nature

# Can my tinnitus be cured?

By speaking to an Audiologist about your tinnitus they can assist you in learning to manage your tinnitus by reducing your awareness of your tinnitus so that it becomes manageable, or even to a point where it is no longer noticeable at all.

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 are no proven benefits to these claims, and there is a risk of negative side effects.

Before trying any of them you should consult your GP, ENT consultant or Audiologist, who are trained and experienced in managing tinnitus.

There are many different management options available but as tinnitus is unique from person to person, it is important to work with a Healthcare Profession to produce a plan which is tailored to your personal needs.

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

It is strongly recommended that you start with an Audiologist who is trained and experienced in managing tinnitus.

The aim of the first consultation is to better understand the history of your tinnitus and can include discussions regarding the onset, 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 into detail on these issues as this will help them to identify the direction best suited for managing your tinnitus. In addition to a consultation, you may be asked to fill out a questionnaire to more clearly understand how your tinnitus is affecting you.

Help from a network of professionals  
Your Audiologist may decide to involve other Healthcare

Professionals such as Ear Nose and Throat doctors (ENTs), otolaryngologists or otologists to rule out any underlying medical complications that could cause or contribute to your tinnitus.

A psychologist and/or psychiatrist may be involved in the management of tinnitus if the Audiologist determines that your needs are beyond their scope of practice. This is usually only in cases where tinnitus is

having a significant effect on an individual's mental health and further counselling and support is required.

Some studies have shown that high doses of sodium or caffeine can exacerbate tinnitus, reducing your intake of these may be beneficial. Furthermore, stress can aggravate tinnitus, and so you may be recommended some relaxation strategies, such as meditation, mindfulness, yoga or therapeutic massage.

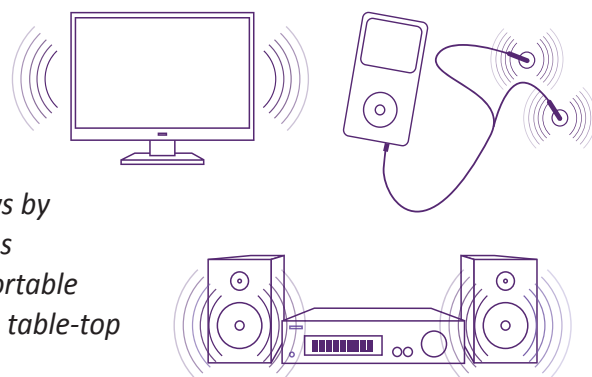
# What management options are available?

There are a number of different management options available for tinnitus and your Audiologist will work with you to create a bespoke plan for you.

One of the more well-known management plans is Sound Therapy, which is the use of sound enrichment to reduce the

perceived obviousness and intrusiveness of the tinnitus signal, making it easier for the brain to ignore it. In addition to a Tinnitus Sound Generator device, other sound-generators, such as sound pillows, radios, TV, etc. can be used to help reduce awareness of tinnitus.

**Figure 3**  
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 (and not masked completely) 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. 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.

## Tinnitus Retraining Therapy

Another well-known management plan is Tinnitus Retraining Therapy (TRT). In TRT, emphasis is placed on sound-enrichment and counselling. 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 incorporated into TRT to provide a combined solution to tinnitus treatment.



# 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 reduce awareness of 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 devices, as well as custom-made options that are designed to fit in the ear canal. 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 individualised, comfortable settings for your particular needs. Some specialised TSG

products even offer a soothing “ocean wave” sound 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 reduce awareness of the tinnitus by reducing interaction with the hearing aid, making it easier for you to get on with your daily activities without having to continually adjust controls on the device.

## Combination hearing devices

Should you also have a hearing loss that requires hearing aid amplification, 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. This provides the flexibility and convenience you and your audiologist 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 Audiologist

about what option may be most appropriate for you.

It is important to remember that TSG and combination devices are not cures. They are tools to be used in conjunction with an individualised management plan and tinnitus counselling. TSG and combination TSG/hearing devices can be very effective when used appropriately, and with the right management plan.



**Figure 5**  
*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 negatively 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.

The goal of a TSG or combination device is to decrease the perceived strength of the tinnitus signal, making it less obvious and less intrusive, and hence easier to ignore. This way, the tinnitus gets filtered out at a subconscious level, just like unimportant daily

sounds like the humming of a fridge. When tinnitus sounds get filtered out rather than escalated to a conscious level, 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 your Audiologist while using a particular TSG or combination device.

# Tinnitus app

Danalogic Tinnitus handbook

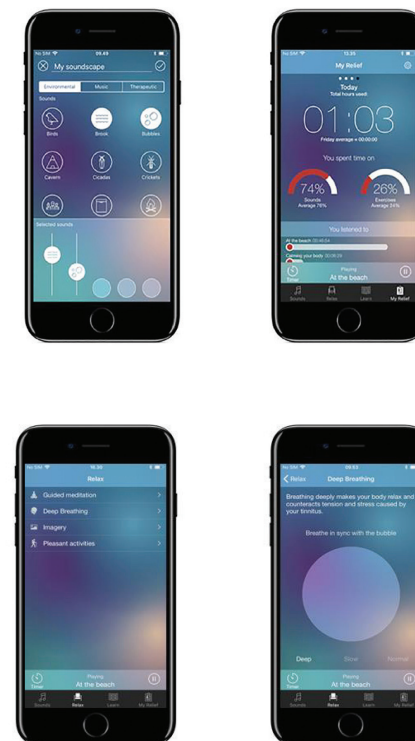
## Tinnitus app

When it comes to managing individual tinnitus needs, there's no such thing as too much personalisation. As well as the Sound Generator option built into the tinnitus hearing devices, GN Hearing has developed a Relief™ app to further personalise management plans.

## Relief™ app

The Relief app offers layered sound landscapes, guided relaxation exercises, and additional activities that create a completely personalised tinnitus solution.

\*The GN Hearing Tinnitus App is available for download from the App Store for iOS devices and Google Play™ for select Android devices.



# 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**

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 (e.g. ear plugs) 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. Exposure to loud noise can damage the hair cells of the inner ear, which can exacerbate tinnitus.

# What defines successful tinnitus management?

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 management 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.

## **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 management plan.

The most important thing to remember is to start by finding a hearing care professional who 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.

## Informational references

### British Tinnitus Association

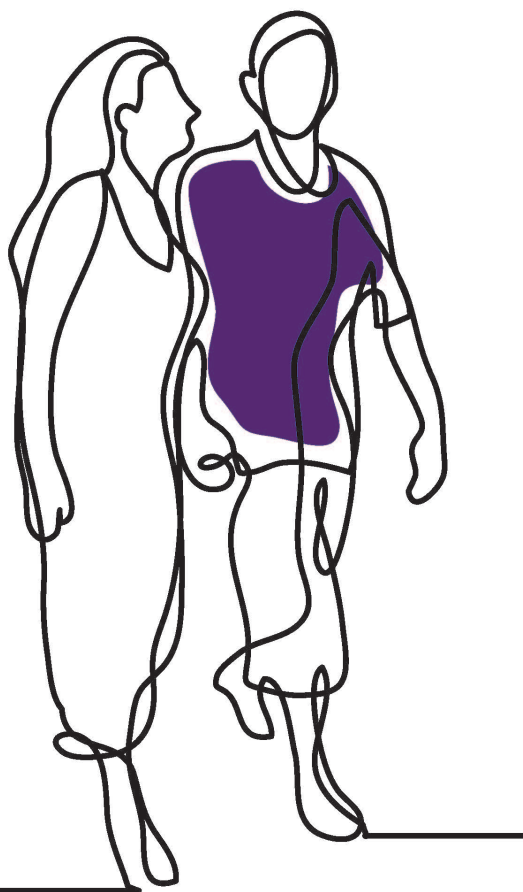
<http://www.tinnitus.org.uk>

### Action on hearing loss

[www.actiononhearingloss.org.uk](http://www.actiononhearingloss.org.uk)

### NHS

[www.nhs.uk/conditions/tinnitus](http://www.nhs.uk/conditions/tinnitus)



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