

Tinnitus – Ringing in the Ears

What is tinnitus?

Tinnitus is a condition usually described as ringing in the ears that can only be heard by the individual experiencing the condition. Tinnitus is not associated with any psychological disorders, i.e. patients are not imagining the sound. Other sounds associated with tinnitus include buzzing, hissing, whistling, whooshing, roaring, clicking, chirping, screeching, static, pulsing, or even a musical sound. The noise can be low- or high-pitched, intermittent or continuous, heard indeterminately within the head or in one or both ears, and the volume can fluctuate during the day, often becoming most intense at night or in times of relative quiet. Some cases of tinnitus are temporary, while others are permanent. Some cases are so severe as to be debilitating, causing difficulty hearing, concentrating, sleeping, and working.



Tinnitus is usually described as a ringing in the ears.

There are two general types of tinnitus, **subjective** and **objective**:

Subjective tinnitus is the most common, accounting for over 99% of cases. In this type of tinnitus, only the sufferer can hear the noises.

Objective tinnitus, on the other hand, is very rare. In this type of tinnitus, the patient's circulatory or somatic systems create the noises and they can be heard by others.

Tinnitus is one of the most common health problems in the United States, affecting almost 50 million people, or nearly 15% of the population. Of those, approximately 2 million experience debilitating tinnitus. In Germany, about 19 million people have tinnitus, about 2.7 million of those cases are chronic, and 1 million are very severe. About 10% of the United Kingdom's population suffers from this condition.



Tinnitus can cause adverse psychological and emotional side effects.

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of tinnitus. Because the TMJ shares some ligaments and nerve connections with structures in the middle ear, the auditory system can be affected by such damage.

Sinus pressure and barometric trauma, which can affect normal hearing and cause symptoms of tinnitus. Rapid or intense changes in air or water pressure from diving, flying, or explosions can damage the middle and inner ear.



Rapid pressure changes when diving can lead to tinnitus.

Traumatic brain injury, which is caused by a concussive shock, can damage the brain's sound processing system.

Some medications, called "ototoxic" because they harm the inner ear, usually cause temporary tinnitus. Once patients stop taking the medications, the symptoms of tinnitus go away. However, some cases can be more permanent, such as those caused by non-steroidal anti-inflammatory drugs (NSAIDs such as aspirin and ibuprofen), some antibiotics and cancer medications, water pills and diuretics, and quinine-based medications.

Other medical conditions, such as diabetes and cardiovascular disease, as well as metabolic, autoimmune, blood vessel, psychiatric, vestibular, and tumor-related disorders, can lead to tinnitus symptoms.

How can tinnitus be treated?

While there is as-yet no scientifically-proven cure for tinnitus, there are several existing ways to manage the condition. These treatments generally address the underlying cause (which can eliminate tinnitus perception) or reduce the perception of tinnitus by distracting the patient or training the brain to ignore the sound. Some ways to manage underlying causes include removing obstructions in the ear (although some obstructions can cause permanent damage), caring for ear and sinus infections, discontinuing use of ototoxic medications, and treating TMJ disorders.

For chronic tinnitus, there are several treatments:

Improving general health and wellbeing can lessen the perceived intensity of tinnitus. Some ways to improve health include eating a healthful diet, regular exercise, social activity, recreation, hobbies, stress management, relaxation, hypnotherapy, wearing ear protection, and practicing common sense when using personal music devices.



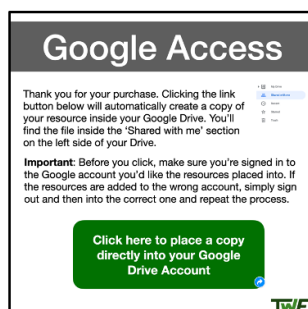
Improving health and wellbeing through diet and exercise can help reduce tinnitus perception.

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Behavioral therapies help patients control tinnitus-related anxiety, depression, and anger.

Drug therapies can help patients manage stress, anxiety, and depression.

Experimental therapies are ongoing, and include various forms of electromagnetic stimulation to reduce the brain's perception of tinnitus.

Reading Comprehension Questions:

1. What
2. What
3. What is the most common cause of tinnitus? What are some examples of ways this can come about?
4. What
5. List four other causes of tinnitus and their associated treatments.

Extension Questions:

6. Explain
7. Tabletop devices for sound therapy are only temporary solutions. Why is this? If you were a sound therapy engineer, what would you create to give patients lasting relief?
8. Research

Reading Comprehension Questions:

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