Tinnitus

Tinnitus is the perception of sound when no corresponding external sound is present.[1] While often described as a ringing, it may also sound like a clicking, buzzing, hiss, or roaring.[2] Rarely, unclear voices or music are heard.[3] The sound may be soft or loud, low or high pitched, and appear to be coming from one or both ears.[2] Most of the time, it comes on gradually.[3] In some people, the sound may interfere with concentration or cause anxiety or depression.[2] Tinnitus may be associated with some degree of hearing loss.[2]

Rather than a disease, tinnitus is a symptom that may result from various underlying causes.[2] A common cause is noise-induced hearing loss.[2] Other causes include ear infections, disease of the heart or blood vessels, Ménière's disease, brain tumors, exposure to certain medications, a previous head injury, earwax, and emotional stress.[2][4] It is more common in those with depression.[3]

The diagnosis of tinnitus is usually based on the person's description.[3] It is commonly supported by an audiogram and a neurological examination.[1][3] The degree of interference with a person's life may be quantified with questionnaires.[3] If certain problems are found, medical imaging, such as magnetic resonance imaging (MRI), may be performed.[3] Other tests are suitable when tinnitus occurs with the same rhythm as the heartbeat.[3] Rarely, the sound may be heard by someone else using a stethoscope, in which case it is known as objective tinnitus.[3] Occasionally, spontaneous otoacoustic emissions, sounds produced normally by the inner ear, may result in tinnitus.[6]

Prevention involves avoiding loud noise.[2] If there is an underlying cause, treating it may lead to improvements.[3] Otherwise, typically, management involves talk therapy.[5] Sound generators or hearing aids may help some.[2] As of 2013, there were no effective medications.[3] It is common, affecting about 10–15% of people.[5] Most, however, tolerate it well, and it is a significant problem in only 1–2% of people.[5] The word tinnitus comes from the Latin *tinnīre* which means "to ring".[3]

Tinnitus

Tinnitus often results in the perception of ringing

Pronunciation	/ˈtɪnɪtəs/ or /tɪˈnaɪtəs/
Specialty	Otorhinolaryngology, audiology
Symptoms	Hearing sound when no external sound is present[1]
Complications	Poor concentration, anxiety, depression[2]
Usual onset	Gradual[3]
Causes	Noise-induced hearing loss, ear infections, disease of the heart or blood vessels, Ménière's disease, brain tumors, emotional stress[2][4]
Diagnostic method	Based on symptoms, audiogram,

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	neurological exam[1][3]
Treatment	Counseling, sound generators, hearing aids[2][5]
Frequency	~12.5%[5]

Signs and symptoms

Tinnitus may be perceived in one or both ears. The noise can be described in many different ways, but is reported as a noise inside a person's head in the absence of auditory stimulation. It often is described as a ringing noise, but in some people, it takes the form of a high-pitched whining, electric buzzing, hissing, humming, tinging, whistling, ticking, clicking, roaring, beeping, sizzling, a pure steady tone such as that heard during a hearing test, or sounds that slightly resemble human voices, tunes, songs, or animal sounds such as "crickets", "tree frogs", or "locusts (cicadas)".[4] Tinnitus may be intermittent or continuous: in the latter case, it may be the cause of great distress. In some individuals, the intensity may be changed by shoulder, head, tongue, jaw, or eye movements.[7]

The sound perceived may range from a quiet background noise to one that even is heard over loud external sounds. The specific type of tinnitus called pulsatile tinnitus is characterized by hearing the sounds of one's own pulse or muscle contractions, which is typically a result of sounds that have been created by the movement of muscles near to one's ear, or the sounds are related to blood flow in the neck or face.[8]

Course

Due to variations in study designs, data on the course of tinnitus showed few consistent results. Generally, the prevalence increased with age in adults, whereas the ratings of annoyance decreased with duration.[9][10][11]

Psychological effects

Besides being an annoying condition to which most people adapt, persistent tinnitus may cause anxiety and depression in some people.[12][13] Tinnitus annoyance is more strongly associated with the psychological condition of the person than the loudness or frequency range.[14][15] Psychological problems such as depression, anxiety, sleep disturbances, and concentration difficulties are common in those with strongly annoying tinnitus.[16][17] 45% of people with tinnitus have an anxiety disorder at some time in their life.[18]

Psychological research has focussed on the tinnitus distress reaction (TDR) to account for differences in tinnitus severity.[16][19][20][21] These findings suggest that among those people, conditioning at the initial perception of tinnitus, linked tinnitus with negative emotions, such as fear and anxiety from unpleasant stimuli at the time. This enhances activity in the limbic system and autonomic nervous system, thus increasing tinnitus awareness and annoyance.[22]

Causes

Tinnitus may be classified in two types: *subjective tinnitus* and *objective tinnitus*.[3] Tinnitus is usually subjective, meaning that the sounds the person hears are not detectable by means currently available to phyiscians and hearing technitians.[3] Subjective tinnitus has also been called "tinnitus aurium", "non-auditory" or "non-vibratory" tinnitus. In rare cases tinnitus can be heard by someone else using a stethoscope. Even more rarely, in some cases it can be measured as a spontaneous otoacoustic emission (SOAE) in the ear canal. This is classified as objective tinnitus,[3] also called "pseudo-tinnitus" or "vibratory" tinnitus.

Subjective tinnitus

Subjective tinnitus is the most frequent type of tinnitus. It may have many possible causes, but most commonly it results from hearing loss. When the tinnitus is caused by disorders of the inner ear or auditory nerve it is called otic (from the Greek word for ear).[23] These otological or neurological conditions include those triggered by infections, drugs, or trauma.[24] A frequent cause is traumatic noise exposure that damages hair cells in the inner ear.

When there does not seem to be a connection with a disorder of the inner ear or auditory nerve, the tinnitus is called nonotic (i.e. not otic). In some 30% of tinnitus cases, the tinnitus is influenced by the somatosensory system, for instance people can increase or decrease their tinnitus by moving their face, head, or neck.[25] This type is called somatic or craniocervical tinnitus, since it is only head or neck movements that have an effect.[23]

There is a growing body of evidence suggesting that some tinnitus is a consequence of neuroplastic alterations in the central auditory pathway. These alterations are assumed to result from a disturbed sensory input, caused by hearing loss.[26] Hearing loss could indeed cause a homeostatic response of neurons in the central auditory system, and therefore cause tinnitus.[27]

Hearing loss

The most common cause of tinnitus is noise-induced hearing loss. Hearing loss may have many different causes, but among those with tinnitus, the major cause is cochlear injury.[26]

Ototoxic drugs also may cause subjective tinnitus, as they may cause hearing loss, or increase the damage done by exposure to loud noise. Those damages may occur even at doses that are not considered ototoxic.[28] More than 260 medications have been reported to cause tinnitus as a side effect.[29] In many cases, however, no underlying cause could be identified.[2]

Tinnitus can also occur due to the discontinuation of therapeutic doses of benzodiazepines. It can sometimes be a protracted symptom of benzodiazepine withdrawal and may persist for many months.[30][31] Medications such as bupropion may also result in tinnitus.[32] In many cases, however, no underlying cause can be identified.[33]

Associated factors

Factors associated with tinnitus include:[34]

- ear problems and hearing loss:
  - conductive hearing loss
    - acoustic shock
    - loud noise or music[35]
    - middle ear effusion
    - otitis
    - otosclerosis
    - Eustachian tube dysfunction
  - sensorineural hearing loss
    - excessive or loud noise
    - presbycusis (age-associated hearing loss)
    - Ménière's disease
    - endolymphatic hydrops
    - superior canal dehiscence
    - acoustic neuroma
    - mercury or lead poisoning
    - ototoxic medications
- neurologic disorders:
  - Arnold–Chiari malformation
  - multiple sclerosis
  - head injury
  - temporomandibular joint dysfunction
  - giant cell arteritis
- metabolic disorders:
  - vitamin B_{12} deficiency[36]
  - iron deficiency anemia

- psychiatric disorders
  - depression
  - anxiety disorders
- other factors:
  - vasculitis
  - Some psychedelic drugs can produce temporary tinnitus-like symptoms as a side effect
    - 5-MeO-DET[37]
    - diisopropyltryptamine (DiPT)[38]
  - benzodiazepine withdrawal[30][31]
  - intracranial hyper or hypotension caused by, for example, encephalitis or a cerebrospinal fluid leak

Objective tinnitus

Objective tinnitus can be detected by other people and is sometimes caused by an involuntary twitching of a muscle or a group of muscles (myoclonus) or by a vascular condition. In some cases, tinnitus is generated by muscle spasms around the middle ear.[8]

Spontaneous otoacoustic emissions (SOAEs), which are faint high-frequency tones that are produced in the inner ear and can be measured in the ear canal with a sensitive microphone, may also cause tinnitus.[6] About 8% of those with SOAEs and tinnitus have SOAE-linked tinnitus, while the percentage of all cases of tinnitus caused by SOAEs is estimated at about 4%.[6]

Pulsatile tinnitus

Some people experience a sound that beats in time with their pulse, known as *pulsatile tinnitus* or *vascular tinnitus*.[39] Pulsatile tinnitus is usually objective in nature, resulting from altered blood flow, increased blood turbulence near the ear, such as from atherosclerosis or venous hum,[40] but it can also arise as a subjective phenomenon from an increased awareness of blood flow in the ear.[39] Rarely, pulsatile tinnitus may be a symptom of potentially life-threatening conditions such as carotid artery aneurysm[41] or carotid artery dissection.[42] Pulsatile tinnitus may also indicate vasculitis, or more specifically, giant cell arteritis. Pulsatile tinnitus may also be an indication of idiopathic intracranial hypertension.[43] Pulsatile tinnitus can be a symptom of intracranial vascular abnormalities and should be evaluated for *irregular noises of blood flow* (bruits).[44]

Pathophysiology

The mechanisms of subjective tinnitus are often obscure. While it is not surprising that direct trauma to the inner ear can cause tinnitus, other apparent causes (e.g., temporomandibular joint dysfunction) are difficult to explain.

It may be caused by increased neural activity in the auditory brainstem, where the brain processes sounds, causing some auditory nerve cells to become over-excited. The basis of this theory is that many with tinnitus also have hearing loss.[45]

Three reviews of 2016 emphasized the large range and possible combinations of pathologies involved in tinnitus, which in turn result in a great variety of symptoms demanding specifically adapted therapies.[46][47][48]

Diagnosis

The diagnosistic approach is based on a history of the condition and an examination head, neck, and neurological system.[33] Typically an audiogram is done, and occasionally medical imaging or electronystagmography.[33] Treatable conditions may include middle ear infection, acoustic neuroma, concussion, and otosclerosis.[49]

Evaluation of tinnitus can include a hearing test (audiogram), measurement of acoustic parameters of the tinnitus like pitch and loudness, and psychological assessment of comorbid conditions like depression, anxiety, and stress that are associated with severity of the tinnitus.

The accepted definition of chronic tinnitus, as compared to normal ear noise experience, is five minutes of ear noise occurring at least twice a week.[50] However, people with chronic tinnitus often experience the noise more frequently than this and can experience it continuously or regularly, such as during the night when there is less environmental noise to mask the sound.

Audiology

Since most persons with tinnitus also have hearing loss, a pure tone hearing test resulting in an audiogram may help diagnose a cause, though some persons with tinnitus do not have hearing loss. An audiogram may also facilitate fitting of a hearing aid in those cases where hearing loss is significant. The pitch of tinnitus is often in the range of the hearing loss.

Psychoacoustics

Acoustic qualification of tinnitus will include measurement of several acoustic parameters like frequency in cases of monotone tinnitus or frequency range and bandwidth in cases of narrow band noise tinnitus, loudness in dB above hearing threshold at the indicated frequency, mixing-point, and minimum masking level.[51] In most cases, tinnitus pitch or frequency range is between 5 kHz and 10 kHz,[52] and loudness between 5 and 15 dB above the hearing threshold.[53]

Another relevant parameter of tinnitus is residual inhibition, the temporary suppression or disappearance of tinnitus following a period of masking. The degree of residual inhibition may indicate how effective tinnitus maskers would be as a treatment modality.[54][55]

An assessment of hyperacusis, a frequent accompaniment of tinnitus,[56] may also be made.[57] The measured parameter is Loudness Discomfort Level (LDL) in dB, the subjective level of acute discomfort at specified frequencies over the frequency range of hearing. This defines a dynamic range between the hearing threshold at that frequency and the loudnes discomfort level. A compressed dynamic range over a particular frequency range is associated with subjectve hyperacusis. Normal hearing threshold is generally defined as 0–20 decibels (dB). Normal loudness discomfort levels are 85–90+ dB, with some authorities citing 100 dB. A dynamic range of 55 dB or less is indicative of hyperacusis.[58][59]

Severity

The condition is often rated on a scale from "slight" to "catastrophic" according to the effects it has, such as interference with sleep, quiet activities and normal daily activities.[60] In an extreme case, a man committed suicide after being told there was no cure.[61]

Assessment of psychological processes related to tinnitus involves measurement of tinnitus severity and distress (i.e., nature and extent of tinnitus-related problems), measured subjectively by validated self-report tinnitus questionnaires.[16] These questionnaires measure the degree of psychological distress and handicap associated with tinnitus, including effects on hearing, lifestyle, health and emotional functioning.[62][63][64] A broader assessment of general functioning, such as levels of anxiety, depression, stress, life stressors and sleep difficulties, is also important in the assessment of tinnitus due to higher risk of negative well-being across these areas, which may be affected by or exacerbate the tinnitus symptoms for the individual.[65] Overall, current assessment measures are aimed to identify individual levels of distress and interference, coping responses and perceptions of tinnitus in order to inform treatment and monitor progress. However, wide variability, inconsistencies and lack of consensus regarding assessment methodology are evidenced in the literature, limiting comparison of treatment effectiveness.[66] Developed to guide diagnosis or classify severity, most tinnitus questionnaires have been shown to be treatment-sensitive outcome measures.[67]

Pulsatile tinnitus

If the examination reveals a bruit (sound due to turbulent blood flow), imaging studies such as transcranial doppler (TCD) or magnetic resonance angiography (MRA) should be performed.[68][69][70]

Differential diagnosis

Other potential sources of the sounds normally associated with tinnitus should be ruled out. For instance, two recognized sources of high-pitched sounds might be electromagnetic fields common in modern wiring and various sound signal transmissions. A common and often misdiagnosed condition that mimics tinnitus is radio frequency (RF) hearing, in which subjects have been tested and found to hear high-pitched transmission frequencies that sound similar to tinnitus.[71][72]

Prevention

Prolonged exposure to loud sound or noise levels can lead to tinnitus.[73] Ear plugs or other measures can help with prevention. Employers may use hearing loss prevention programs to help educate and prevent dangerous levels of exposure to noise. Groups like NIOSH and OSHA help set regulations to ensure employees, if following the protocol, should have minimal risk to permanent damage to their hearing.[74]

Safety sign from the UK Government
Regulations requiring ear protection

Several medicines have ototoxic effects, and can have a cumulative effect that can increase the damage done by noise. If ototoxic medications must be administered, close attention by the physician to prescription details, such as dose and dosage interval, can reduce the damage done.[75][76][77]

Management

If there is an underlying cause, treating it may lead to improvements.[3] Otherwise, the primary treatment for tinnitus is talk therapy,[5] sound therapy, or hearing aids. There are no effective medications or supplements that treat tinnitus.[3][78]

Psychological

The best supported treatment for tinnitus is a type of counseling called cognitive behavioral therapy (CBT) which can be delivered via the internet or in person.[5][67][79] It decreases the amount of stress those with tinnitus feel.[80] These benefits appear to be independent of any effect on depression or anxiety in an individual.[79] Acceptance and commitment therapy (ACT) also shows promise in the treatment of tinnitus.[81] Relaxation techniques may also be useful.[3] A clinical protocol called Progressive Tinnitus Management for treatment of tinnitus has been developed by the United States Department of Veterans Affairs.[82]

Medications

As of 2018 there were no medications effective for idiopathic tinnitus.[3][73][83] There is not enough evidence to determine if antidepressants[84] or acamprosate are useful.[85] There is no high-quality evidence to support the use of benzodiazepines for tinnitus.[3][83][86] Usefulness of melatonin, as of 2015, is unclear.[87] It is unclear if anticonvulsants are useful for treating tinnitus.[3][88] Steroid injections into the middle ear also do not seem to be effective.[89][90] There is no evidence to suggest that the use of betahistine to treat tinnitius is effective.[91]

Botulinum toxin injection has been tried with some success in some of the rare cases of objective tinnitus from a palatal tremor.[92]

Caroverine is used in a few countries to treat tinnitus.[93] The evidence for its usefulness is very weak.[94]

Other

The use of sound therapy by either hearing aids or tinnitus maskers helps the brain ignore the specific tinnitus frequency. Although these methods are poorly supported by evidence, there are no negative effects.[3][95][96] There are several approaches for tinnitus sound therapy. The first is sound modification to compensate for the individual's hearing loss. The second is a signal spectrum notching to eliminate energy close to the tinnitus frequency.[97][98] There is some tentative evidence supporting tinnitus retraining therapy, which is aimed at reducing tinnitus-related neuronal activity.[3][99][100] There are preliminary data on an alternative tinnitus treatment using mobile applications, including various methods: masking, sound therapy, relaxing exercises and other.[101][102] These applications can work as a separate device or as a hearing aid control system.[103] There is little evidence supporting the use of transcranial magnetic stimulation;[3][104] consequently it is not recommended.[73] As of 2017 there was limited evidence on the helpfulness of neurofeedback.[105]

Alternative medicine

Ginkgo biloba does not appear to be effective.[83][106] The American Academy of Otolaryngology recommends against taking melatonin or zinc supplements to relieve symptoms of tinnitus, and reported that evidence for efficacy of many dietary supplements—lipoflavonoids, garlic, homeopathy, traditional

Chinese/Korean herbal medicine, honeybee larvae, other various vitamins and minerals—did not exist.[73] A 2016 Cochrane Review also concluded that evidence was not sufficient to support taking zinc supplements to reduce symptoms associated with tinnitus.[107]

Prognosis

While there is no cure, most people with tinnitus get used to it over time; for a minority, it remains a significant problem.[5]

Epidemiology

Adults

Tinnitus affects 10–15% of people.[5] About a third of North Americans over 55 experience tinnitus.[108] Tinnitus affects one third of adults at some time in their lives, whereas ten to fifteen percent are disturbed enough to seek medical evaluation.[109]

Children

Tinnitus is commonly thought of as a symptom of adulthood, and is often overlooked in children. Children with hearing loss have a high incidence of tinnitus, even though they do not express the condition or its effect on their lives.[110] Children do not generally report tinnitus spontaneously and their complaints may not be taken seriously.[111] Among those children who do complain of tinnitus, there is an increased likelihood of associated otological or neurological pathology such as migraine, juvenile Meniere's disease or chronic suppurative otitis media.[112] Its reported prevalence varies from 12% to 36% in children with normal hearing thresholds and up to 66% in children with a hearing loss and approximately 3–10% of children have been reported to be troubled by tinnitus.[113]

See also

- Health effects from noise
- List of people with tinnitus
- List of unexplained sounds
- Phantom vibration syndrome
- Zwicker tone
- Auditory hallucination

References

1. Levine, RA; Oron, Y (2015). "Tinnitus". *The Human Auditory System - Fundamental Organization and Clinical Disorders*. Handbook of Clinical Neurology. **129**. pp. 409–31. doi:10.1016/B978-0-444-62630-1.00023-8 (https://doi.org/10.1016%2FB978-0-444-62630-1.00023-8). ISBN 9780444626301. PMID 25726282 (https://pubmed.ncbi.nlm.nih.gov/25726282).

2. "Tinnitus" (http://www.nidcd.nih.gov/health/hearing/Pages/tinnitus.aspx). *NIH – National Institute on Deafness and Other Communication Disorders (NIDCD)*. 6 March 2017. Archived (https://web.archive.org/web/20190403204320/https://www.nidcd.nih.gov/health/tinnitus) from the original on 3 April 2017. Retrieved 20 September 2019.
3. Baguley, D; McFerran, D; Hall, D (Nov 9, 2013). "Tinnitus" (http://eprints.nottingham.ac.uk/3228/2/Hall-Tinnitus.pdf) (PDF). *The Lancet*. **382** (9904): 1600–07. doi:10.1016/S0140-6736(13)60142-7 (https://doi.org/10.1016%2FS0140-6736%2813%2960142-7). PMID 23827090 (https://pubmed.ncbi.nlm.nih.gov/23827090). Archived (https://web.archive.org/web/20180411174207/http://eprints.nottingham.ac.uk/3228/2/Hall-Tinnitus.pdf) (PDF) from the original on 2018-04-11.
4. Han BI, Lee HW, Kim TY, Lim JS, Shin KS (March 2009). "Tinnitus: characteristics, causes, mechanisms, and treatments" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2686891). *Journal of Clinical Neurology*. **5** (1): 11–19. doi:10.3988/jcn.2009.5.1.11 (https://doi.org/10.3988%2Fjcn.2009.5.1.11). PMC 2686891 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2686891). PMID 19513328 (https://pubmed.ncbi.nlm.nih.gov/19513328). "About 75% of new cases are related to emotional stress as the trigger factor rather than to precipitants involving cochlear lesions."
5. Langguth, B; Kreuzer, PM; Kleinjung, T; De Ridder, D (Sep 2013). "Tinnitus: causes and clinical management". *The Lancet Neurology*. **12** (9): 920–30. doi:10.1016/S1474-4422(13)70160-1 (https://doi.org/10.1016%2FS1474-4422%2813%2970160-1). PMID 23948178 (https://pubmed.ncbi.nlm.nih.gov/23948178).
6. Henry, JA; Dennis, KC; Schechter, MA (October 2005). "General review of tinnitus: prevalence, mechanisms, effects, and management". *Journal of Speech, Language, and Hearing Research*. **48** (5): 1204–35. doi:10.1044/1092-4388(2005/084) (https://doi.org/10.1044%2F1092-4388%282005%2F084%29). PMID 16411806 (https://pubmed.ncbi.nlm.nih.gov/16411806).
7. Simmons R, Dambra C, Lobarinas E, Stocking C, Salvi R (2008). "Head, Neck, and Eye Movements That Modulate Tinnitus" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2633109). *Seminars in Hearing*. **29** (4): 361–70. doi:10.1055/s-0028-1095895 (https://doi.org/10.1055%2Fs-0028-1095895). PMC 2633109 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2633109). PMID 19183705 (https://pubmed.ncbi.nlm.nih.gov/19183705).
8. "Tinnitus" (http://www.entnet.org/HealthInformation/tinnitus.cfm). American Academy of Otolaryngology – Head and Neck Surgery. 2012-04-03. Archived (https://web.archive.org/web/20121016235345/http://www.entnet.org/HealthInformation/tinnitus.cfm) from the original on 2012-10-16. Retrieved 2012-10-26.
9. Baguley D; Andersson g; McFerran D; McKenna L (2013). *Tinnitus: A Multidisciplinary Approach* (2nd ed.). Blackwell Publishing Ltd. pp. 16–17. ISBN 978-1118488706.
10. Gopinath B, McMahon CM, Rochtchina E, Karpa MJ, Mitchell P (2010). "Incidence, persistence, and progression of tinnitus symptoms in older adults: the Blue Mountains Hearing Study". *Ear and Hearing*. **31** (3): 407–12. doi:10.1097/AUD.0b013e3181cdb2a2 (https://doi.org/10.1097%2FAUD.0b013e3181cdb2a2). PMID 20124901 (https://pubmed.ncbi.nlm.nih.gov/20124901).
11. Shargorodsky J, Curhan GC, Farwell WR (2010). "Prevalence and characteristics of tinnitus among US adults". *The American Journal of Medicine*. **123** (8): 711–18. doi:10.1016/j.amjmed.2010.02.015 (https://doi.org/10.1016%2Fj.amjmed.2010.02.015). PMID 20670725 (https://pubmed.ncbi.nlm.nih.gov/20670725).
12. Andersson G (2002). "Psychological aspects of tinnitus and the application of cognitive-behavioral therapy". *Clinical Psychology Review*. **22** (7): 977–90. doi:10.1016/s0272-7358(01)00124-6 (https://doi.org/10.1016%2Fs0272-7358%2801%2900124-6). PMID 12238249 (https://pubmed.ncbi.nlm.nih.gov/12238249).
13. Reiss M, Reiss G (1999). "Some psychological aspects of tinnitus". *Perceptual and Motor Skills*. **88** (3 Pt 1): 790–92. doi:10.2466/pms.1999.88.3.790 (https://doi.org/10.2466%2Fpms.1999.88.3.790). PMID 10407886 (https://pubmed.ncbi.nlm.nih.gov/10407886).

14. Baguley DM (2002). "Mechanisms of tinnitus". *British Medical Bulletin*. **63**: 195–212. doi:10.1093/bmb/63.1.195 (https://doi.org/10.1093%2Fbmb%2F63.1.195). PMID 12324394 (https://pubmed.ncbi.nlm.nih.gov/12324394).
15. Henry JA, Meikele MB (1999). "Pulsed versus continuous tones for evaluating the loudness of tinnitus". *Journal of the American Academy of Audiology*. **10** (5): 261–72. PMID 10331618 (https://pubmed.ncbi.nlm.nih.gov/10331618).
16. Henry JA, Dennis KC, Schechter MA (2005). "General review of tinnitus: Prevalence, mechanisms, effects, and management". *Journal of Speech, Language, and Hearing Research*. **48** (5): 1204–35. doi:10.1044/1092-4388(2005/084) (https://doi.org/10.1044%2F1092-4388%282005%2F084%29). PMID 16411806 (https://pubmed.ncbi.nlm.nih.gov/16411806).
17. Davies A, Rafie EA (2000). "Epidemiology of Tinnitus". In Tyler, RS (ed.). *Tinnitus Handbook*. San Diego: Singular. pp. 1–23. OCLC 42771695 (https://www.worldcat.org/oclc/42771695).
18. Pattyn T, Van Den Eede F, Vanneste S, Cassiers L, Veltman DJ, Van De Heyning P, Sabbe BC (2015). "Tinnitus and anxiety disorders: A review". *Hearing Research*. **333**: 255–65. doi:10.1016/j.heares.2015.08.014 (https://doi.org/10.1016%2Fj.heares.2015.08.014). PMID 26342399 (https://pubmed.ncbi.nlm.nih.gov/26342399).
19. Henry JA, Wilson P (2000). "Psychological management of tinnitus". In R.S. Tyler (ed.). *Tinnitus Handbook*. San Diego: Singular. pp. 263–79. OCLC 42771695 (https://www.worldcat.org/oclc/42771695).
20. Andersson G, Westin V (2008). "Understanding tinnitus distress: Introducing the concepts of moderators and mediators". *International Journal of Audiology*. **47** (Suppl. 2): S106–11. doi:10.1080/14992020802301670 (https://doi.org/10.1080%2F14992020802301670). PMID 19012118 (https://pubmed.ncbi.nlm.nih.gov/19012118).
21. Weise C, Hesser H, Andersson G, Nyenhuis N, Zastrutzki S, Kröner-Herwig B, Jäger B (2013). "The role of catastrophizing in recent onset tinnitus: its nature and association with tinnitus distress and medical utilization". *International Journal of Audiology*. **52** (3): 177–88. doi:10.3109/14992027.2012.752111 (https://doi.org/10.3109%2F14992027.2012.752111). PMID 23301660 (https://pubmed.ncbi.nlm.nih.gov/23301660).
22. Jastreboff, PJ; Hazell, JWP (2004). *Tinnitus Retraining Therapy: Implementing the neurophysiological model*. Cambridge: Cambridge University Press. OCLC 237191959 (https://www.worldcat.org/oclc/237191959).
23. Robert Aaron Levine (1999). "Somatic (craniocervical) tinnitus and the dorsal cochlear nucleus hypothesis". *American Journal of Otolaryngology*. **20** (6): 351–62. CiteSeerX 10.1.1.22.2488 (https://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.22.2488). doi:10.1016/S0196-0709(99)90074-1 (https://doi.org/10.1016%2FS0196-0709%2899%2990074-1). PMID 10609479 (https://pubmed.ncbi.nlm.nih.gov/10609479).
24. Chan Y (2009). "Tinnitus: etiology, classification, characteristics, and treatment" (http://www.discoverymedicine.com/Yvonne-Chan/2009/10/10/tinnitus-etiology-classification-characteristics-and-treatment/). *Discovery Medicine*. **8** (42): 133–36. PMID 19833060 (https://pubmed.ncbi.nlm.nih.gov/19833060).
25. Barbara Rubinstein; et al. (1990). "Prevalence of Signs and Symptoms of Craniomandibular Disorders in Tinnitus Patients". *Journal of Craniomandibular Disorders*. **4** (3): 186–92. PMID 2098394 (https://pubmed.ncbi.nlm.nih.gov/2098394).

26. Schecklmann, Martin; Vielsmeier, Veronika; Steffens, Thomas; Landgrebe, Michael; Langguth, Berthold; Kleinjung, Tobias; Andersson, Gerhard (18 April 2012). "Relationship between Audiometric Slope and Tinnitus Pitch in Tinnitus Patients: Insights into the Mechanisms of Tinnitus Generation" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3329543). *PLOS ONE*. **7** (4): e34878. Bibcode:2012PLoSO...734878S (https://ui.adsabs.harvard.edu/abs/2012PLoSO...734878S). doi:10.1371/journal.pone.0034878 (https://doi.org/10.1371%2Fjournal.pone.0034878). PMC 3329543 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3329543). PMID 22529949 (https://pubmed.ncbi.nlm.nih.gov/22529949).
27. Schaette, R; McAlpine, D (21 September 2011). "Tinnitus with a Normal Audiogram: Physiological Evidence for Hidden Hearing Loss and Computational Model" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6623281). *The Journal of Neuroscience*. **31** (38): 13452–57. doi:10.1523/JNEUROSCI.2156-11.2011 (https://doi.org/10.1523%2FJNEUROSCI.2156-11.2011). PMC 6623281 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6623281). PMID 21940438 (https://pubmed.ncbi.nlm.nih.gov/21940438).
28. Brown RD, Penny JE, Henley CM, et al. (1981). "Ototoxic drugs and noise". *Ciba Foundation Symposium*. Novartis Foundation Symposia. **85**: 151–71. doi:10.1002/9780470720677.ch9 (https://doi.org/10.1002%2F9780470720677.ch9). ISBN 9780470720677. PMID 7035098 (https://pubmed.ncbi.nlm.nih.gov/7035098).
29. Stas Bekman: stas (at) stason.org. "6) What are some ototoxic drugs?" (http://stason.org/TULARC/health/body/tinnitus-ringing-ears/6-What-are-some-ototoxic-drugs.html). Stason.org. Archived (https://web.archive.org/web/20121019184052/http://stason.org/TULARC/health/body/tinnitus-ringing-ears/6-What-are-some-ototoxic-drugs.html) from the original on 2012-10-19. Retrieved 2012-10-26.
30. Riba, Michelle B; Ravindranath, Divy (12 April 2010). *Clinical manual of emergency psychiatry* (https://books.google.com/?id=l8veL1bDoF8C&pg=PA197). Washington, DC: American Psychiatric Publishing Inc. p. 197. ISBN 978-1585622955.
31. Delanty, Norman (27 November 2001). *Seizures: medical causes and management* (https://books.google.com/?id=u2B3SdfE8-gC&pg=RA1-PA187). Totowa, NJ: Humana Press. p. 187. ISBN 978-0896038271.
32. Fornaro M, Martino M (2010). "Tinnitus psychopharmacology: A comprehensive review of its pathomechanisms and management" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2898164). *Neuropsychiatric Disease and Treatment*. **6**: 209–18. doi:10.2147/ndt.s10361 (https://doi.org/10.2147%2Fndt.s10361). PMC 2898164 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2898164). PMID 20628627 (https://pubmed.ncbi.nlm.nih.gov/20628627).
33. Yew, KS (15 January 2014). "Diagnostic approach to patients with tinnitus". *American Family Physician*. **89** (2): 106–13. PMID 24444578 (https://pubmed.ncbi.nlm.nih.gov/24444578).
34. Crummer RW, Hassan GA (2004). "Diagnostic approach to tinnitus". *American Family Physician*. **69** (1): 120–06. PMID 14727828 (https://pubmed.ncbi.nlm.nih.gov/14727828).
35. Passchier-Vermeer W, Passchier WF (2000). "Noise exposure and public health" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1637786). *Environmental Health Perspectives*. 108 Suppl 1 (Suppl 1): 123–31. doi:10.1289/ehp.00108s1123 (https://doi.org/10.1289%2Fehp.00108s1123). JSTOR 3454637 (https://www.jstor.org/stable/3454637). PMC 1637786 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1637786). PMID 10698728 (https://pubmed.ncbi.nlm.nih.gov/10698728).
36. Zempleni, Janos; Suttie, John W; Gregory, III, Jesse F; Stover, Patrick J, eds. (2014). *Handbook of vitamins* (https://books.google.it/books?id=IEHSBQAAQBAJ&pg=PA477) (Fifth ed.). Hoboken: CRC Press. p. 477. ISBN 978-1466515574. Archived (https://web.archive.org/web/20160817155016/https://books.google.it/books?id=IEHSBQAAQBAJ&pg=PA477) from the original on 2016-08-17.

37. Shulgin, Alexander; Shulgin, Ann (1997). "#36. 5-MEO-DET" (http://www.erowid.org/library/books_online/tihkal/tihkal36.shtml). *TiHKAL: the continuation* (http://www.erowid.org/library/books_online/tihkal/tihkal.shtml). Berkeley, CA: Transform Press. ISBN 978-0963009692. OCLC 38503252 (https://www.worldcat.org/oclc/38503252). Archived (https://web.archive.org/web/20121031144030/http://www.erowid.org/library/books_online/tihkal/tihkal.shtml) from the original on 31 October 2012. Retrieved 27 October 2012.
38. "Erowid Experience Vaults: DiPT – More Tripping & Revelations – 26540" (https://www.erowid.org/experiences/exp.php?ID=26540). Archived (https://web.archive.org/web/20141102115409/https://www.erowid.org/experiences/exp.php?ID=26540) from the original on 2014-11-02.
39. McFerran, Don; Magdalena, Sereda. "Pulsatile tinnitus" (https://www.actiononhearingloss.org.uk/-/media/ahl/documents/publications/factsheets-and-leaflets/factsheets/tinnitus/factsheet-pulsatile-tinnitus.pdf) (PDF). *Action on Hearing Loss*. Royal National Institute for Deaf People (RNID). Retrieved 22 July 2018.
40. Chandler JR (1983). "Diagnosis and cure of venous hum tinnitus". *The Laryngoscope*. **93** (7): 892–95. doi:10.1288/00005537-198307000-00009 (https://doi.org/10.1288%2F00005537-198307000-00009). PMID 6865626 (https://pubmed.ncbi.nlm.nih.gov/6865626).
41. Moonis G, Hwang CJ, Ahmed T, Weigele JB, Hurst RW (2005). "Otologic manifestations of petrous carotid aneurysms". *American Journal of Neuroradiology*. **26** (6): 1324–27. PMID 15956490 (https://pubmed.ncbi.nlm.nih.gov/15956490).
42. Selim, Magdy; Caplan, Louis R (2004). "Carotid Artery Dissection". *Current Treatment Options in Cardiovascular Medicine*. **6** (3): 249–53. doi:10.1007/s11936-996-0020-z (https://doi.org/10.1007%2Fs11936-996-0020-z). ISSN 1092-8464 (https://www.worldcat.org/issn/1092-8464). PMID 15096317 (https://pubmed.ncbi.nlm.nih.gov/15096317). (subscription required)
43. Sismanis A, Butts FM, Hughes GB (2009-01-04). "Objective tinnitus in benign intracranial hypertension: An update". *The Laryngoscope*. **100** (1): 33–36. doi:10.1288/00005537-199001000-00008 (https://doi.org/10.1288%2F00005537-199001000-00008). PMID 2293699 (https://pubmed.ncbi.nlm.nih.gov/2293699).
44. Diamond BJ, Mosley JE (2011). Kreutzer JS, DeLuca J, Caplan B (eds.). *Arteriovenous Malformation (AVM)*. *Encyclopedia of Clinical Neuropsychology*. Springer. pp. 249–252. doi:10.1007/978-0-387-79948-3 (https://doi.org/10.1007%2F978-0-387-79948-3). ISBN 978-0-387-79947-6.
45. Nicolas-Puel C, Faulconbridge RL, Guitton M, Puel JL, Mondain M, Uziel A (2002). "Characteristics of tinnitus and etiology of associated hearing loss: a study of 123 patients". *The International Tinnitus Journal*. **8** (1): 37–44. PMID 14763234 (https://pubmed.ncbi.nlm.nih.gov/14763234).
46. Møller AR (2016). "Sensorineural Tinnitus: Its Pathology and Probable Therapies" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4761664). *International Journal of Otolaryngology*. **2016**: 1–13. doi:10.1155/2016/2830157 (https://doi.org/10.1155%2F2016%2F2830157). PMC 4761664 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4761664). PMID 26977153 (https://pubmed.ncbi.nlm.nih.gov/26977153).
47. Sedley W, Friston KJ, Gander PE, Kumar S, Griffiths TD (2016). "An Integrative Tinnitus Model Based on Sensory Precision" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5152595). *Trends in Neurosciences*. **39** (12): 799–812. doi:10.1016/j.tins.2016.10.004 (https://doi.org/10.1016%2Fj.tins.2016.10.004). PMC 5152595 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5152595). PMID 27871729 (https://pubmed.ncbi.nlm.nih.gov/27871729).
48. Shore SE, Roberts LE, Langguth B (2016). "Maladaptive plasticity in tinnitus – triggers, mechanisms and treatment" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4895692). *Nature Reviews Neurology*. **12** (3): 150–60. doi:10.1038/nrneurol.2016.12 (https://doi.org/10.1038%2Fnrneurol.2016.12). PMC 4895692 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4895692). PMID 26868680 (https://pubmed.ncbi.nlm.nih.gov/26868680).

49. Crummer, RW; et al. (2004). "Diagnostic Approach to Tinnitus". *American Family Physician*. **69** (1): 120–26.
50. Davis, A (1989). "The prevalence of hearing impairment and reported hearing disability among adults in Great Britain". *International Journal of Epidemiology*. **18** (4): 911–17. doi:10.1093/ije/18.4.911 (https://doi.org/10.1093%2Fije%2F18.4.911). PMID 2621028 (https://pubmed.ncbi.nlm.nih.gov/2621028).
51. Henry, JA (2000). "Psychoacoustic Measures of Tinnitus" (https://www.audiology.org/sites/default/files/journal/JAAA_11_03_03.pdf) (PDF). *Journal of the American Academy of Audiology*. **11** (3): 138–55. PMID 10755810 (https://pubmed.ncbi.nlm.nih.gov/10755810). Archived (https://web.archive.org/web/20170808232800/https://www.audiology.org/sites/default/files/journal/JAAA_11_03_03.pdf) (PDF) from the original on August 8, 2017. Retrieved September 22, 2017.
52. Vielsmeier V, Lehner A, Strutz J, Steffens T, Kreuzer PM, Schecklmann M, Landgrebe M, Langguth B, Kleinjung T (2015). "The Relevance of the High Frequency Audiometry in Tinnitus Patients with Normal Hearing in Conventional Pure-Tone Audiometry" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4637018). *BioMed Research International*. **2015**: 1–5. doi:10.1155/2015/302515 (https://doi.org/10.1155%2F2015%2F302515). PMC 4637018 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4637018). PMID 26583098 (https://pubmed.ncbi.nlm.nih.gov/26583098).
53. Basile CÉ, Fournier P, Hutchins S, Hébert S (2013). "Psychoacoustic assessment to improve tinnitus diagnosis" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3861445). *PLOS ONE*. **8** (12): e82995. Bibcode:2013PLoSO...882995B (https://ui.adsabs.harvard.edu/abs/2013PLoSO...882995B). doi:10.1371/journal.pone.0082995 (https://doi.org/10.1371%2Fjournal.pone.0082995). PMC 3861445 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3861445). PMID 24349414 (https://pubmed.ncbi.nlm.nih.gov/24349414).
54. Roberts LE (2007). "Residual inhibition". *Tinnitus: Pathophysiology and Treatment*. Progress in Brain Research. **166**. pp. 487–95. doi:10.1016/S0079-6123(07)66047-6 (https://doi.org/10.1016%2FS0079-6123%2807%2966047-6). ISBN 978-0444531674. PMID 17956813 (https://pubmed.ncbi.nlm.nih.gov/17956813).
55. Roberts LE, Moffat G, Baumann M, Ward LM, Bosnyak DJ (2008). "Residual inhibition functions overlap tinnitus spectra and the region of auditory threshold shift" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2580805). *Journal of the Association for Research in Otolaryngology*. **9** (4): 417–35. doi:10.1007/s10162-008-0136-9 (https://doi.org/10.1007%2Fs10162-008-0136-9). PMC 2580805 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2580805). PMID 18712566 (https://pubmed.ncbi.nlm.nih.gov/18712566).
56. Knipper M, Van Dijk P, Nunes I, Rüttiger L, Zimmermann U (2013). "Advances in the neurobiology of hearing disorders: recent developments regarding the basis of tinnitus and hyperacusis". *Progress in Neurobiology*. **111**: 17–33. doi:10.1016/j.pneurobio.2013.08.002 (https://doi.org/10.1016%2Fj.pneurobio.2013.08.002). PMID 24012803 (https://pubmed.ncbi.nlm.nih.gov/24012803).
57. Tyler RS, Pienkowski M, Roncancio ER, Jun HJ, Brozoski T, Dauman N, Dauman N, Andersson G, Keiner AJ, Cacace AT, Martin N, Moore BC (2014). "A review of hyperacusis and future directions: part I. Definitions and manifestations" (http://successforkidswithhearingloss.com/wp-content/uploads/2015/01/Hyperacusis-Part-1.pdf) (PDF). *American Journal of Audiology*. **23** (4): 402–19. doi:10.1044/2014_AJA-14-0010 (https://doi.org/10.1044%2F2014_AJA-14-0010). PMID 25104073 (https://pubmed.ncbi.nlm.nih.gov/25104073). Archived (https://web.archive.org/web/20180509171602/http://successforkidswithhearingloss.com/wp-content/uploads/2015/01/Hyperacusis-Part-1.pdf) (PDF) from the original on May 9, 2018. Retrieved September 23, 2017.

58. Sherlock LP, Formby C (2005). "Estimates of loudness, loudness discomfort, and the auditory dynamic range: normative estimates, comparison of procedures, and test-retest reliability". *Journal of the American Academy of Audiology*. **16** (2): 85–100. doi:10.3766/jaaa.16.2.4 (https://doi.org/10.3766%2Fjaaa.16.2.4). PMID 15807048 (https://pubmed.ncbi.nlm.nih.gov/15807048).
59. Pienkowski M, Tyler RS, Roncancio ER, Jun HJ, Brozoski T, Dauman N, Coelho CB, Andersson G, Keiner AJ, Cacace AT, Martin N, Moore BC (2014). "A review of hyperacusis and future directions: part II. Measurement, mechanisms, and treatment" (https://semanticscholar.org/paper/702520ac0076221005327c583aea03d872a93973). *American Journal of Audiology*. **23** (4): 420–36. doi:10.1044/2014_AJA-13-0037 (https://doi.org/10.1044%2F2014_AJA-13-0037). PMID 25478787 (https://pubmed.ncbi.nlm.nih.gov/25478787).
60. McCombe A, Baguley D, Coles R, McKenna L, McKinney C, Windle-Taylor P (2001). "Guidelines for the grading of tinnitus severity: the results of a working group commissioned by the British Association of Otolaryngologists, Head and Neck Surgeons, 1999" (https://www.researchgate.net/publication/11673848). *Clinical Otolaryngology and Allied Sciences*. **26** (5): 388–93. doi:10.1046/j.1365-2273.2001.00490.x (https://doi.org/10.1046%2Fj.1365-2273.2001.00490.x). PMID 11678946 (https://pubmed.ncbi.nlm.nih.gov/11678946). Archived (https://web.archive.org/web/20170924001713/https://www.researchgate.net/profile/David_Baguley/publication/11673848_Guidelines_for_the_grading_of_tinnitus_severity_The_results_of_a_working_group_commissioned_by_the_British_Association_of_Otolaryngologists_Head_and_Neck_Surgeons_1999/links/0deec52d7db89c0d7f000000/Guidelines-for-the-grading-of-tinnitus-severity-The-results-of-a-working-group-commissioned-by-the-British-Association-of-Otolaryngologists-Head-and-Neck-Surgeons-1999.pdf) (PDF) from the original on 2017-09-24.
61. "James Jones's 80ft death jump after tinnitus 'torture' " (https://www.bbc.co.uk/news/uk-wales-34982844). *BBC News*. 2 December 2015. Archived (https://web.archive.org/web/20151204232902/http://www.bbc.co.uk/news/uk-wales-34982844) from the original on 4 December 2015. Retrieved 2 December 2015.
62. Langguth B, Goodey R, Azevedo A, et al. (2007). "Consensus for tinnitus patient assessment and treatment outcome measurement: Tinnitus Research Initiative meeting, Regensburg, July 2006". *Tinnitus: Pathophysiology and Treatment*. Progress in Brain Research. **166**. pp. 525–36. doi:10.1016/S0079-6123(07)66050-6 (https://doi.org/10.1016%2FS0079-6123%2807%2966050-6). ISBN 978-0444531674. PMC 4283806 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4283806). PMID 17956816 (https://pubmed.ncbi.nlm.nih.gov/17956816).
63. Meikle MB, Stewart BJ, Griest SE, et al. (2007). "Assessment of tinnitus: Measurement of treatment outcomes" (http://khosro.goorabi.ir/wp-content/uploads/2017/06/AD-032-Tinnitus-Pathophysiology-and-Treatment.pdf#page=530) (PDF). *Tinnitus: Pathophysiology and Treatment*. Progress in Brain Research. **166**. pp. 511–21. doi:10.1016/S0079-6123(07)66049-X (https://doi.org/10.1016%2FS0079-6123%2807%2966049-X). ISBN 978-0444531674. PMID 17956815 (https://pubmed.ncbi.nlm.nih.gov/17956815). Archived (https://web.archive.org/web/20170925181716/http://khosro.goorabi.ir/wp-content/uploads/2017/06/AD-032-Tinnitus-Pathophysiology-and-Treatment.pdf#page=530) (PDF) from the original on 2017-09-25.
64. Meikle MB, Henry JA, Griest SE, et al. (2012). "The tinnitus functional index: development of a new clinical measure for chronic, intrusive tinnitus" (https://www.ncrar.research.va.gov/Education/Documents/TinnitusDocuments/TFI_EarHearing_2011.pdf) (PDF). *Ear and Hearing*. **33** (2): 153–76. doi:10.1097/AUD.0b013e31822f67c0 (https://doi.org/10.1097%2FAUD.0b013e31822f67c0). PMID 22156949 (https://pubmed.ncbi.nlm.nih.gov/22156949). Archived (https://web.archive.org/web/20170125173121/http://www.ncrar.research.va.gov/Education/Documents/TinnitusDocuments/TFI_EarHearing_2011.pdf) (PDF) from the original on 2017-01-25.

65. Henry, J. L.; Wilson, PH (2000). *The Psychological Management of Chronic Tinnitus: A Cognitive Behavioural Approach*. Allyn and Bacon.
66. Landgrebe M, Azevedo A, Baguley D, Bauer C, Cacace A, Coelho C, et al. (2012). "Methodological aspects of clinical trials in tinnitus: A proposal for international standard" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3897200). *Journal of Psychosomatic Research*. **73** (2): 112–21. doi:10.1016/j.jpsychores.2012.05.002 (https://doi.org/10.1016%2Fj.jpsychores.2012.05.002). PMC 3897200 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3897200). PMID 22789414 (https://pubmed.ncbi.nlm.nih.gov/22789414).
67. Martinez-Devesa, P; Perera, R; Theodoulou, M; Waddell, A (Sep 8, 2010). "Cognitive behavioural therapy for tinnitus" (https://lirias.kuleuven.be/handle/123456789/579694). *The Cochrane Database of Systematic Reviews* (9): CD005233. doi:10.1002/14651858.CD005233.pub3 (https://doi.org/10.1002%2F14651858.CD005233.pub3). PMID 20824844 (https://pubmed.ncbi.nlm.nih.gov/20824844).
68. Pegge S, Steens S, Kunst H, Meijer F (2017). "Pulsatile Tinnitus: Differential Diagnosis and Radiological Work-Up" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5263210). *Current Radiology Reports*. **5** (1): 5. doi:10.1007/s40134-017-0199-7 (https://doi.org/10.1007%2Fs40134-017-0199-7). PMC 5263210 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5263210). PMID 28203490 (https://pubmed.ncbi.nlm.nih.gov/28203490).
69. Hofmann E, Behr R, Neumann-Haefelin T, Schwager K (2013). "Pulsatile tinnitus: imaging and differential diagnosis" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3719451). *Deutsches Arzteblatt International*. **110** (26): 451–58. doi:10.3238/arztebl.2013.0451 (https://doi.org/10.3238%2Farztebl.2013.0451). PMC 3719451 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3719451). PMID 23885280 (https://pubmed.ncbi.nlm.nih.gov/23885280).
70. Sismanis A (2011). "Pulsatile tinnitus: contemporary assessment and management" (https://www.researchgate.net/publication/224888455). *Current Opinion in Otolaryngology & Head and Neck Surgery*. **19** (5): 348–57. doi:10.1097/MOO.0b013e3283493fd8 (https://doi.org/10.1097%2FMOO.0b013e3283493fd8). PMID 22552697 (https://pubmed.ncbi.nlm.nih.gov/22552697). Archived (https://web.archive.org/web/20170925181459/https://www.researchgate.net/profile/Aristides_Sismanis/publication/224888455_Pulsatile_tinnitus_Contemporary_assessment_and_management/links/573f7b0208ae9ace8413462e/Pulsatile-tinnitus-Contemporary-assessment-and-management.pdf) (PDF) from the original on 2017-09-25.
71. Elder, JA; Chou, CK (2003). "Auditory response to pulsed radiofrequency energy". *Bioelectromagnetics*. Suppl 6: S162–73. doi:10.1002/bem.10163 (https://doi.org/10.1002%2Fbem.10163). PMID 14628312 (https://pubmed.ncbi.nlm.nih.gov/14628312).
72. Lin JC, Wang Z (2007). "Hearing of microwave pulses by humans and animals: effects, mechanism, and thresholds". *Health Physics*. **92** (6): 621–28. doi:10.1097/01.HP.0000250644.84530.e2 (https://doi.org/10.1097%2F01.HP.0000250644.84530.e2). PMID 17495664 (https://pubmed.ncbi.nlm.nih.gov/17495664).
73. Tunkel DE, Bauer CA, Sun GH, et al. (2014). "Clinical practice guideline: tinnitus". *Otolaryngology–Head and Neck Surgery*. **151** (2 Suppl): S1–40. doi:10.1177/0194599814545325 (https://doi.org/10.1177%2F0194599814545325). PMID 25273878 (https://pubmed.ncbi.nlm.nih.gov/25273878).
74. "CDC - NIOSH Program Portfolio : Hearing Loss Prevention : Program Description" (https://www.cdc.gov/niosh/programs/hlp/default.html). *www.cdc.gov*. 2019-02-05. Retrieved 2019-03-26.
75. Cianfrone G, Pentangelo D, Cianfrone F, Mazzei F, Turchetta R, Orlando MP, Altissimi G (2011). "Pharmacological drugs inducing ototoxicity, vestibular symptoms and tinnitus: a reasoned and updated guide" (http://www.europeanreview.org/wp/wp-content/uploads/956.pdf) (PDF). *European Review for Medical and Pharmacological Sciences*. **15** (6): 601–36. PMID 21796866 (https://pubmed.ncbi.nlm.nih.gov/21796866). Archived (https://web.archive.org/web/20170808135100/http://www.europeanreview.org/wp/wp-content/uploads/956.pdf) (PDF) from the original on 2017-08-08.

76. Palomar García, V; Abdulghani Martínez, F; Bodet Agustí, E; Andreu Mencía, L; Palomar Asenjo, V (Jul 2001). "Drug-induced otoxicity: current status". *Acta Oto-Laryngologica*. **121** (5): 569–72. doi:10.1080/00016480121545 (https://doi.org/10.1080%2F00016480121545). PMID 11583387 (https://pubmed.ncbi.nlm.nih.gov/11583387).
77. Seligmann H, Podoshin L, Ben-David J, Fradis M, Goldsher M (1996). "Drug-induced tinnitus and other hearing disorders". *Drug Safety*. **14** (3): 198–212. doi:10.2165/00002018-199614030-00006 (https://doi.org/10.2165%2F00002018-199614030-00006). PMID 8934581 (https://pubmed.ncbi.nlm.nih.gov/8934581).
78. "Drug Therapies" (https://www.ata.org/managing-your-tinnitus/treatment-options/drug-therapies). *www.ata.org*. 2015-03-20. Retrieved 2019-03-26.
79. Hoare D, Kowalkowski V, Knag S, Hall D (2011). "Systematic review and meta-analyses of randomized controlled trials examining tinnitus management" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3477633). *The Laryngoscope*. **121** (7): 1555–64. doi:10.1002/lary.21825 (https://doi.org/10.1002%2Flary.21825). PMC 3477633 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3477633). PMID 21671234 (https://pubmed.ncbi.nlm.nih.gov/21671234).
80. Hesser H, Weise C, Zetterquist Westin V, Andersson G (2011). "A systematic review and meta-analysis of randomized controlled trials of cognitive–behavioral therapy for tinnitus distress". *Clinical Psychology Review*. **31** (4): 545–53. doi:10.1016/j.cpr.2010.12.006 (https://doi.org/10.1016%2Fj.cpr.2010.12.006). PMID 21237544 (https://pubmed.ncbi.nlm.nih.gov/21237544).
81. Ost, LG (October 2014). "The efficacy of Acceptance and Commitment Therapy: an updated systematic review and meta-analysis". *Behaviour Research and Therapy*. **61**: 105–21. doi:10.1016/j.brat.2014.07.018 (https://doi.org/10.1016%2Fj.brat.2014.07.018). PMID 25193001 (https://pubmed.ncbi.nlm.nih.gov/25193001).
82. Henry J, Zaugg T, Myers P, Kendall C (2012). "Chapter 9 – Level 5 Individualized Support" (http://www.ncrar.research.va.gov/Education/Documents/TinnitusDocuments/Index.asp). *Progressive Tinnitus Management: Clinical Handbook for Audiologists*. US Department of Veterans Affairs, National Center for Rehabilitative Auditory Research. Archived (https://web.archive.org/web/20131220223240/http://www.ncrar.research.va.gov/Education/Documents/TinnitusDocuments/Index.asp) from the original on 2013-12-20. Retrieved 2013-12-20.
83. Bauer, CA (March 2018). "Tinnitus". *New England Journal of Medicine*. **378** (13): 1224–31. doi:10.1056/NEJMcp1506631 (https://doi.org/10.1056%2FNEJMcp1506631). PMID 29601255 (https://pubmed.ncbi.nlm.nih.gov/29601255).
84. Baldo, P; Doree, C; Molin, P; McFerran, D; Cecco, S (Sep 12, 2012). "Antidepressants for patients with tinnitus". *Cochrane Database of Systematic Reviews*. **9** (9): CD003853. doi:10.1002/14651858.CD003853.pub3 (https://doi.org/10.1002%2F14651858.CD003853.pub3). PMID 22972065 (https://pubmed.ncbi.nlm.nih.gov/22972065).
85. Savage, J; Cook, S; Waddell, A (Nov 12, 2009). "Tinnitus" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2907768). *BMJ Clinical Evidence*. **2009**. PMC 2907768 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2907768). PMID 21726476 (https://pubmed.ncbi.nlm.nih.gov/21726476).
86. Savage, J; Waddell, A (October 2014). "Tinnitus" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4202663). *BMJ Clinical Evidence*. **2014**: 0506. PMC 4202663 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4202663). PMID 25328113 (https://pubmed.ncbi.nlm.nih.gov/25328113).
87. Miroddi, M; Bruno, R; Galletti, F; Calapai, F; Navarra, M; Gangemi, S; Calapai, G (March 2015). "Clinical pharmacology of melatonin in the treatment of tinnitus: a review". *European Journal of Clinical Pharmacology*. **71** (3): 263–70. doi:10.1007/s00228-015-1805-3 (https://doi.org/10.1007%2Fs00228-015-1805-3). PMID 25597877 (https://pubmed.ncbi.nlm.nih.gov/25597877).

88. Hoekstra, Carlijn El; Rynja, Sybren P.; van Zanten, Gijsbert A.; Rovers, Maroeska M. (2011-07-06). "Anticonvulsants for tinnitus" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6599822). *The Cochrane Database of Systematic Reviews* (7): CD007960. doi:10.1002/14651858.CD007960.pub2 (https://doi.org/10.1002%2F14651858.CD007960.pub2). ISSN 1469-493X (https://www.worldcat.org/issn/1469-493X). PMC 6599822 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6599822). PMID 21735419 (https://pubmed.ncbi.nlm.nih.gov/21735419).
89. Pichora-Fuller, MK; Santaguida, P; Hammill, A; Oremus, M; Westerberg, B; Ali, U; Patterson, C; Raina, P (August 2013). "Evaluation and Treatment of Tinnitus: Comparative Effectiveness [Internet]". PMID 24049842 (https://pubmed.ncbi.nlm.nih.gov/24049842).
90. Lavigne, P; Lavigne, F; Saliba, I (23 June 2015). "Intratympanic corticosteroids injections: a systematic review of literature". *European Archives of Oto-Rhino-Laryngology*. **273** (9): 2271–78. doi:10.1007/s00405-015-3689-3 (https://doi.org/10.1007%2Fs00405-015-3689-3). PMID 26100030 (https://pubmed.ncbi.nlm.nih.gov/26100030).
91. Hall, Deborah A; Wegner, Inge; Smit, Adriana Leni; McFerran, Don; Stegeman, Inge (2018). Cochrane ENT Group (ed.). "Betahistine for tinnitus" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6513648). *Cochrane Database of Systematic Reviews*. **12** (8): CD013093. doi:10.1002/14651858.CD013093 (https://doi.org/10.1002%2F14651858.CD013093). PMC 6513648 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6513648).
92. Slengerik-Hansen J, Ovesen T (2016). "Botulinum Toxin Treatment of Objective Tinnitus Because of Essential Palatal Tremor: A Systematic Review". *Otology & Neurotology*. **37** (7): 820–28. doi:10.1097/MAO.0000000000001090 (https://doi.org/10.1097%2FMAO.0000000000001090). PMID 27273401 (https://pubmed.ncbi.nlm.nih.gov/27273401).
93. Sweetman, Sean C., ed. (2009). *Martindale* (36th ed.). Pharmaceutical Press. p. 2277. ISBN 9780853698401.
94. Langguth, B; Salvi, R; Elgoyhen, AB (December 2009). "Emerging pharmacotherapy of tinnitus" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2832848). *Expert Opinion on Emerging Drugs*. **14** (4): 687–702. doi:10.1517/14728210903206975 (https://doi.org/10.1517%2F14728210903206975). PMC 2832848 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2832848). PMID 19712015 (https://pubmed.ncbi.nlm.nih.gov/19712015).
95. Hoare DJ, Searchfield GD, El Refaie A, Henry JA (2014). "Sound therapy for tinnitus management: practicable options". *Journal of the American Academy of Audiology*. **25** (1): 62–75. doi:10.3766/jaaa.25.1.5 (https://doi.org/10.3766%2Fjaaa.25.1.5). PMID 24622861 (https://pubmed.ncbi.nlm.nih.gov/24622861).
96. Sereda, Magdalena; Xia, Jun; El Refaie, Amr; Hall, Deborah A.; Hoare, Derek J. (2018). "Sound therapy (using amplification devices and/or sound generators) for tinnitus" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6517157). *The Cochrane Database of Systematic Reviews*. **12**: CD013094. doi:10.1002/14651858.CD013094.pub2 (https://doi.org/10.1002%2F14651858.CD013094.pub2). ISSN 1469-493X (https://www.worldcat.org/issn/1469-493X). PMC 6517157 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6517157). PMID 30589445 (https://pubmed.ncbi.nlm.nih.gov/30589445).
97. Shore, Susan E; Roberts, Larry E.; Langguth, Berthold (2016). "Maladaptive plasticity in tinnitus-triggers, mechanisms and treatment" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4895692). *Nature Reviews. Neurology*. **12** (3): 150–160. doi:10.1038/nrneurol.2016.12 (https://doi.org/10.1038%2Fnrneurol.2016.12). ISSN 1759-4758 (https://www.worldcat.org/issn/1759-4758). PMC 4895692 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4895692). PMID 26868680 (https://pubmed.ncbi.nlm.nih.gov/26868680).
98. Hesse, Gerhard (2016-12-15). "Evidence and evidence gaps in tinnitus therapy" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5169077). *GMS Current Topics in Otorhinolaryngology, Head and Neck Surgery*. **15**: Doc04. doi:10.3205/cto000131 (https://doi.org/10.3205%2Fcto000131). ISSN 1865-1011 (https://www.worldcat.org/issn/1865-1011). PMC 5169077 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5169077). PMID 28025604 (https://pubmed.ncbi.nlm.nih.gov/28025604).

99. Phillips JS, McFerran D (2010). "Tinnitus Retraining Therapy (TRT) for tinnitus". *Cochrane Database of Systematic Reviews* (3): CD007330. doi:10.1002/14651858.CD007330.pub2 (https://doi.org/10.1002%2F14651858.CD007330.pub2). PMID 20238353 (https://pubmed.ncbi.nlm.nih.gov/20238353).
100. Hesse, Gerhard (2016-12-15). "Evidence and evidence gaps in tinnitus therapy" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5169077). *GMS Current Topics in Otorhinolaryngology, Head and Neck Surgery*. **15**: Doc04. doi:10.3205/cto000131 (https://doi.org/10.3205%2Fcto000131). ISSN 1865-1011 (https://www.worldcat.org/issn/1865-1011). PMC 5169077 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5169077). PMID 28025604 (https://pubmed.ncbi.nlm.nih.gov/28025604).
101. Casale, Manuele; Costantino, Andrea; Rinaldi, Vittorio; Forte, Antonio; Grimaldi, Marta; Sabatino, Lorenzo; Oliveto, Giuseppe; Aloise, Fabio; Pontari, Domenico (2018-11-11). "Mobile applications in otolaryngology for patients: An update" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6302723). *Laryngoscope Investigative Otolaryngology*. **3** (6): 434–438. doi:10.1002/lio2.201 (https://doi.org/10.1002%2Flio2.201). ISSN 2378-8038 (https://www.worldcat.org/issn/2378-8038). PMC 6302723 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6302723). PMID 30599026 (https://pubmed.ncbi.nlm.nih.gov/30599026).
102. Mosa, Abu Saleh Mohammad; Yoo, Illhoi; Sheets, Lincoln (2012-07-10). "A Systematic Review of Healthcare Applications for Smartphones" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3534499). *BMC Medical Informatics and Decision Making*. **12**: 67. doi:10.1186/1472-6947-12-67 (https://doi.org/10.1186%2F1472-6947-12-67). ISSN 1472-6947 (https://www.worldcat.org/issn/1472-6947). PMC 3534499 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3534499). PMID 22781312 (https://pubmed.ncbi.nlm.nih.gov/22781312).
103. Kalle, Sven; Schlee, Winfried; Pryss, Rüdiger C.; Probst, Thomas; Reichert, Manfred; Langguth, Berthold; Spiliopoulou, Myra (2018-08-20). "Review of Smart Services for Tinnitus Self-Help, Diagnostics and Treatments" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6109754). *Frontiers in Neuroscience*. **12**: 541. doi:10.3389/fnins.2018.00541 (https://doi.org/10.3389%2Ffnins.2018.00541). ISSN 1662-4548 (https://www.worldcat.org/issn/1662-4548). PMC 6109754 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6109754). PMID 30177869 (https://pubmed.ncbi.nlm.nih.gov/30177869).
104. Meng, Z; Liu, S; Zheng, Y; Phillips, JS (Oct 5, 2011). "Repetitive transcranial magnetic stimulation for tinnitus". *Cochrane Database of Systematic Reviews* (10): CD007946. doi:10.1002/14651858.CD007946.pub2 (https://doi.org/10.1002%2F14651858.CD007946.pub2). PMID 21975776 (https://pubmed.ncbi.nlm.nih.gov/21975776).
105. Güntensperger, D; Thüring, C; Meyer, M; Neff, P; Kleinjung, T (2017). "Neurofeedback for Tinnitus Treatment - Review and Current Concepts" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5717031). *Frontiers in Aging Neuroscience*. **9**: 386. doi:10.3389/fnagi.2017.00386 (https://doi.org/10.3389%2Ffnagi.2017.00386). PMC 5717031 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5717031). PMID 29249959 (https://pubmed.ncbi.nlm.nih.gov/29249959).
106. Hilton, MP; Zimmermann, EF; Hunt, WT (Mar 28, 2013). "Ginkgo biloba for tinnitus". *Cochrane Database of Systematic Reviews*. **3** (3): CD003852. doi:10.1002/14651858.CD003852.pub3 (https://doi.org/10.1002%2F14651858.CD003852.pub3). PMID 23543524 (https://pubmed.ncbi.nlm.nih.gov/23543524).
107. Person, Osmar C; Puga, Maria ES; da Silva, Edina MK; Torloni, Maria R (2016-11-23). "Zinc supplements for tinnitus" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6464312). *Cochrane Database of Systematic Reviews*. **11**: CD009832. doi:10.1002/14651858.cd009832.pub2 (https://doi.org/10.1002%2F14651858.cd009832.pub2). PMC 6464312 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6464312). PMID 27879981 (https://pubmed.ncbi.nlm.nih.gov/27879981).

108. Sanchez TG, Rocha CB (2011). "Diagnosis and management of somatosensory tinnitus: review article" (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3129953). *Clinics*. **66** (6): 1089–94. doi:10.1590/S1807-59322011000600028 (https://doi.org/10.1590%2FS1807-59322011000600028). PMC 3129953 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3129953). PMID 21808880 (https://pubmed.ncbi.nlm.nih.gov/21808880).
109. Heller AJ (2003). "Classification and epidemiology of tinnitus". *Otolaryngologic Clinics of North America*. **36** (2): 239–48. doi:10.1016/S0030-6665(02)00160-3 (https://doi.org/10.1016%2FS0030-6665%2802%2900160-3). PMID 12856294 (https://pubmed.ncbi.nlm.nih.gov/12856294).
110. Celik, N; Bajin, MD; Aksoy, S (2009). "Tinnitus incidence and characteristics in children with hearing loss" (http://advancedotology.org/IAO5_3/Bajin.pdf) (PDF). *Journal of International Advanced Otology*. **5** (3): 363–69. ISSN 1308-7649 (https://www.worldcat.org/issn/1308-7649). OCLC 695291085 (https://www.worldcat.org/oclc/695291085). Archived (https://web.archive.org/web/20131221015940/http://advancedotology.org/IAO5_3/Bajin.pdf) (PDF) from the original on 2013-12-21. Retrieved 2013-02-02.
111. Mills, RP; Albert, D; Brain, C (1986). "Tinnitus in childhood". *Clinical Otolaryngology and Allied Sciences*. **11** (6): 431–34. doi:10.1111/j.1365-2273.1986.tb00147.x (https://doi.org/10.1111%2Fj.1365-2273.1986.tb00147.x). PMID 3815868 (https://pubmed.ncbi.nlm.nih.gov/3815868).
112. Ballantyne JC (2009). Graham JM; Baguley D (eds.). *Ballantyne's Deafness* (Seventh ed.). Chichester: Wiley-Blackwell. OCLC 275152841 (https://www.worldcat.org/oclc/275152841).
113. Shetye A, Kennedy V (2010). "Tinnitus in children: an uncommon symptom?" (https://www.researchgate.net/publication/43049877). *Archives of Disease in Childhood*. **95** (8): 645–48. doi:10.1136/adc.2009.168252 (https://doi.org/10.1136%2Fadc.2009.168252). PMID 20371585 (https://pubmed.ncbi.nlm.nih.gov/20371585). Archived (https://web.archive.org/web/20170929000621/https://www.researchgate.net/profile/Veronica_Kennedy/publication/43049877_Tinnitus_in_children_An_uncommon_symptom/links/5790870808ae0831552f27fb.pdf) (PDF) from the original on 2017-09-29.

External links

- Tinnitus (https://curlie.org/Health/Conditions_and_Diseases/Ear%2C_Nose_and_Throat/Ear/Tinnitus/) at Curlie
- Baguley, David; Andersson, Gerhard; McFerran, Don; McKenna, Laurence (March 2013) [2004]. *Tinnitus: A Multidisciplinary Approach* (2nd ed.). Indianapolis, IN: Wiley-Blackwell. ISBN 978-1405199896. LCCN 2012032714 (https://lccn.loc.gov/2012032714). OCLC 712915603 (https://www.worldcat.org/oclc/712915603).
- Langguth, B; Hajak, G; Kleinjung, T; Cacace, A; Møller, AR, eds. (December 2007). *Tinnitus: pathophysiology and treatment* (http://site.ebrary.com/lib/alltitles/docDetail.action?docID=10206018). Progress in brain research. **166** (1st ed.). Amsterdam; Boston: Elsevier. ISBN 978-0444531674. LCCN 2012471552 (https://lccn.loc.gov/2012471552). OCLC 648331153 (https://www.worldcat.org/oclc/648331153). Archived (https://books.google.com/books?id=XydUtbVHtdEC&printsec=frontcover&dq=Tinnitus:+Pathophysiology+and+Treatment) from the original on 2007. Retrieved 5 November 2012.

Classification	**ICD-10**: H93.1 (http://apps.who.int/classifications/icd10/browse/2016/en#/H93.1) · **ICD-9-CM**: 388.3 (http://www.icd9data.com/getICD9Code.ashx?icd9=388.3) · **MeSH**: D014012 (https://www.nlm.nih.gov/cgi/mesh/2015/MB_cgi?field=uid&term=D014012) · **DiseasesDB**: 27662 (http://www.diseasesdatabase.com/ddb27662.htm)
External	**MedlinePlus**:

- Møller, Aage R; Langguth, Berthold; Ridder, Dirk; et al., eds. (2011). *Textbook of Tinnitus* (http://www.springerlink.com/content/m172lg/#section=813352&page=1). New York, NY: Springer. doi:10.1007/978-1-60761-145-5 (https://doi.org/10.1007%2F978-1-60761-145-5). ISBN 978-1607611448. LCCN 2010934377 (https://lccn.loc.gov/2010934377). OCLC 695388693 (https://www.worldcat.org/oclc/695388693), 771366370 (https://www.worldcat.org/oclc/771366370), 724696022 (https://www.worldcat.org/oclc/724696022). Archived (https://books.google.com/books?id=YStcWFsxQZEC&printsec=frontcover&dq=textbook+of+Tinnitus#v=onepage&q=textbook%2of%20Tinnitus&f=false) from the original on 2011. Retrieved 5 November 2012. (subscription required)

resources	003043 (https://www.nlm.nih.gov/medlineplus/ency/article/003043.htm) · **eMedicine**: ent/235 (https://emedicine.medscape.com/ent/235-overview) · **Patient UK**: Tinnitus (https://patient.info/doctor/tinnitus-pro)