

TINNITUS

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Definition and Overview^{1,2,5,6}

Tinnitus is a common symptom that is described as the perception of sound, either unilaterally or bilaterally, in the absence of an external auditory stimulus. It can be described in many different ways including a ringing, hissing or buzzing sensation (indicating a central pathology) or popping, clicking, or banging sounds (indicating an external or palatal pathology). The nature of the sound can be continuous, vibratory, high pitched, low pitched, or pulsatile. The most frequent association with tinnitus is hearing loss. Commonly tinnitus has a heterogeneous quality making it difficult to determine the etiology. Tinnitus can be characterized as subjective or objective. Objective tinnitus is an uncommon finding and refers to a sound heard by an independent observer. However, subjective tinnitus cannot be measured.

Differential Diagnosis	
Subjective Tinnitus	Objective Tinnitus
Otologic: hearing loss, meniere's disease, acoustic neuroma, cerumen impaction, otitis media, otitis externa	Vascular: arterial bruit, venous hum, arteriovenous malformation, vascular tumour
Ototoxic medications: ASA, NSAIDS, methotrexate, cisplatin, bleomycin, furosemide, mercury, lead	Neuro: palatomyoclonus, stapedius muscle spasm
Neuro: multiple sclerosis, head injury	
Metabolic: thyroid disease, hyperlipidemia, B12 deficiency	
Psychogenic: depression, anxiety	

Diagnostic Considerations^{1,2,5,6}

History:

- Classification: subjective versus objective
- Onset: progressive versus sudden
- Location: bilateral versus unilateral
- Type: buzzing, ringing, snapping, hissing
- Duration: continuous versus intermittent versus pulsatile
- Positional changes
- Temporal worsening (ie ?night)

- Associated symptoms: hearing loss, aural fullness, vertigo, headache, neurological symptoms, visual changes
- Medication history
- Noise exposure
- Head trauma
- Family history
- Inquire about how tinnitus is affecting daily living using the Tinnitus Handicap Inventory (THI)³

*Red Flags:³

Pulsatile tinnitus, unilateral tinnitus, tinnitus associated with other unilateral otologic symptom

Physical:

- Head and neck exam, including external ear, canal, tympanic membrane
- Oral cavity and TMJ joint
- Cranial nerve exam
- Auscultation over neck, periauricular region, orbits
- To assess for venous vascular pathology, compression of the ipsilateral jugular vein can lead to improvement of the tinnitus
- Weber and Rinne tests will help determine the location and type of hearing deficits.

Investigations:^{1,4}

- Referral for comprehensive audiometric testing to determine degree of hearing loss:
 - o Audiography
 - o Speech discrimination testing
 - o Tympanometry
- CBC, TSH, B12, lipid profile
- If suspected venous or mass lesion, CT or MRI

Reasons for referral to specialists³

- Associated deafness or an abnormal ear condition
- Pulsatile tinnitus, unless associated with an acute inflammatory ear condition
- Persistent (> 3 months) unilateral tinnitus
- Persistent intrusive tinnitus

Management^{1,4}

- Discontinue any ototoxic drugs
- Mild Tinnitus (not affecting function):
 - o Address underlying cause if possible
 - o Reassurance
 - o Lifestyle modification (targeting caffeine, sodium, alcohol, sugar intake and smoking) x 1 month
- Moderate Tinnitus (affecting sleep and some interference with daily functioning):
 - o Address underlying cause if possible
 - o Assess need for hearing aids
 - o Consider sound generating devices that produce ambient sounds; white noise can reduce the detectability of tinnitus
 - o Tinnitus Retraining Therapy (<http://tinnitusretrainingtherapy.ca>)
- Tinnitus Retraining Therapy is based on two strategies which involve removing the negative connotations with tinnitus perception via directive counselling and the second strategy involves removing tinnitus from conscious perception via sound therapy
 - o Consider cognitive behavioral therapy if there are changes in mood
- Severe Tinnitus (significantly affecting daily function with mood changes):
 - o Address underlying cause is possible
 - o Patient education, cognitive behavioral therapy, consider SSRI or TCA treatment
 - o Surgical intervention controversial and not recommended

Bottom Line^{1,2,3,4}

Tinnitus is a complex disorder that is poorly understood. A good history and physical can determine the type of tinnitus. Assessing the effect of tinnitus on mood is important. Some cases of tinnitus are irreversible thus patient education and counselling is key. Although several strategies are available, most focus on reducing the impact of tinnitus on daily function and many have been unproven.