

A triage guide for tinnitus

Ringing in the ears may be symptomatic of a serious condition—or it may be benign. This guide can help you tell the difference.

PRACTICE RECOMMENDATIONS

› Let patients know that they can learn to manage their reactions to tinnitus with methods that include stress reduction, therapeutic sound, and coping skills. **A**

› Refer patients with tinnitus to an audiologist for a hearing evaluation, assessment of the tinnitus, and, if indicated, support in learning to manage reactions to tinnitus. **A**

› Give patients with suicidal ideation or extreme anxiety or depression in response to tinnitus a same-day referral to a mental health professional. **A**

› Provide an urgent referral to an otolaryngologist or emergency care if you suspect sudden sensorineural hearing loss or another urgent medical condition. **A**

Strength of recommendation (SOR)

- A** Good-quality patient-oriented evidence
- B** Inconsistent or limited-quality patient-oriented evidence
- C** Consensus, usual practice, opinion, disease-oriented evidence, case series

“Doctor, I have this ringing in my ears.”

With an estimated 10% to 15% of adults experiencing chronic tinnitus,¹ most primary care physicians are familiar with this complaint. The prevalence of tinnitus increases with age and with exposure to high levels of noise—the most commonly reported cause.¹ With people living longer and such “toxic” noise levels on the rise, tinnitus is a condition you can expect to encounter even more frequently.

Despite the prevalence of tinnitus, however, there are no clinical standards or best practice guidelines for managing it. Thus, many physicians are uncertain about what to tell patients with this distressing disorder, and when (or whether) to refer them to specialists. So patients are sometimes told that “nothing can be done” and that they simply must “learn to live with” tinnitus.

Such negative messages from a trusted physician can have a detrimental effect, causing some patients to stop seeking help and to become increasingly disturbed by tinnitus.² What’s more, these messages are untrue. Some conditions that result in tinnitus *can* be treated. And, although tinnitus itself cannot normally be cured, there are numerous interventions and educational strategies that can help patients change their reactions to—and learn to cope with—the ringing in their ears. We developed this evidence-based review and tinnitus triage guide (**TABLE 1**) to help family physicians respond appropriately to this distressing, but common, condition.

Is it transient noise, or tinnitus?

Virtually everyone experiences “transient ear noise,” which is usually described as a whistling sound accompanied by a sensation of sudden temporary hearing loss.^{3,4} These idiopathic episodes are usually unilateral, and often accompanied by a feeling of ear blockage.

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TABLE 1
Tinnitus triage guide²⁷

If the patient	Refer to	Status/considerations
Has neural deficits such as facial weakness, head trauma, or other urgent medical condition	Otolaryngology or ED	Emergency
Has unexplained sudden hearing loss	Audiology and otolaryngology	Emergency; must see audiologist prior to otolaryngologist on same day
Expresses suicidal ideation or manifests obvious mental illness	Mental health or ED	May be emergency; report suicide ideation; provide escort, if necessary
Has any of the following: <ul style="list-style-type: none"> • symptoms suggestive of somatic origin of tinnitus (eg, tinnitus that pulses with heartbeat) • persistent otalgia or otorrhea • vestibular symptoms (eg, dizziness/vertigo) 	Otolaryngology and audiology	Urgent; schedule otolaryngology exam as soon as possible
Has symptoms that suggest a neurophysiologic origin of tinnitus without: <ul style="list-style-type: none"> • ear pain, drainage, or malodor • vestibular symptoms • sudden hearing loss • facial weakness or paralysis 	Audiology and otolaryngology	Nonurgent; schedule audiology exam before patient sees otolaryngologist

ED, emergency department.

>
 There is no prescription drug specifically for tinnitus, but antidepressants or anxiolytics may relieve associated symptoms of psychological distress.

To distinguish between tinnitus—the perception of sound that is produced internally, rather than by an external stimulus—and transient ear noise, consider the duration and frequency. Transient ear noise generally disappears within seconds (and does not require diagnostic testing or treatment). Tinnitus, which can have a variety of underlying pathologies, is defined as ear or head noise that lasts at least 5 minutes and occurs at least twice a week.⁵

Neurophysiologic tinnitus is most common

Neurophysiologic (sensorineural) tinnitus, which originates within the auditory nervous system, accounts for the vast majority of cases. The pathology exists anywhere between the cochlea and the auditory cortex, and excludes any sounds generated by mechanical

(somatic) processes.⁶

The ringing may be relatively soft; in some cases, it can be heard only in quiet environments or while the patient is trying to sleep. In others, the tinnitus may be constant, interfering with concentration and daily activities, as well as sleep. In the most severe cases, tinnitus may be associated with severe depression and anxiety, even to the point of suicidal ideation.⁷

Notably, however, the loudness or other perceptual characteristics of tinnitus do not necessarily indicate the degree to which it is a problem for the patient.⁷ Although patients often report that tinnitus interferes with their hearing, they usually also have hearing loss, which an audiologic evaluation will reveal.⁷⁻⁹

Certain medications can trigger or exacerbate tinnitus, including aspirin, nonsteroidal anti-inflammatory drugs, loop diuretics,

and quinine.² Fairly high doses are usually required to cause tinnitus, however, and the effects are typically temporary. Patients have also reported exacerbation of tinnitus due to alcohol, salt, and caffeine intake. Ototoxicity from aminoglycosides and platinum-containing chemotherapeutic drugs is a well-known cause of hearing loss and tinnitus, but these effects are often irreversible.^{10,11}

Neurophysiologic tinnitus is generally not serious from a medical standpoint. While all patients with this condition should undergo an audiologic exam and hearing evaluation, only about 20% of adults who experience tinnitus require intervention.¹²⁻¹⁴ Although there is no cure, patients with clinically significant tinnitus can be taught stress management and therapeutic use of sound techniques, as well as lifestyle modifications (TABLE 2) to minimize its detrimental effects.

Somatic tinnitus may be serious

Somatic tinnitus, also known as somatosound, refers to the perception of sound that originates within the body—in vascular, muscular, skeletal, or respiratory structures, or in the temporomandibular joint.⁴ These “body sounds” have an internal acoustic source.⁹

■ **Pulsatile tinnitus**, which pulses in synchrony with the heartbeat, is the most common somatosound.^{15,16} Most patients with pulsatile tinnitus have benign venous “hums,” but serious conditions such as arteriovenous malformations, glomus tumors, and carotid stenosis must be considered. Auscultation over the neck and temporal bone may reveal bruits that can help localize the lesion. We recommend either magnetic resonance imaging (MRI) of the head or computed tomography (CT) angiography, accompanied by timely referral to an otolaryngologist for a focused evaluation.^{15,17,18}

■ **Somatosounds can also be nonpulsatile**, indicating a nonvascular source. Examples of nonvascular somatosounds include middle-ear muscle spasms and eustachian tube dysfunction. Nonpulsatile somatic tinnitus is rarely progressive or dangerous. It is reasonable to offer reassurance to patients with nonpulsatile tinnitus, followed by a referral to an otolaryngologist if the symptoms interfere with daily activities.

TABLE 2

Managing neurophysiologic tinnitus: A range of options^{2,5,25-27}

Cognitive-behavioral therapy
Elimination of tinnitus-inducing medications (eg, NSAIDs, loop diuretics, and quinine)
Hearing aids, sound generators, or other sound devices
Lifestyle modifications (eg, improve sleep hygiene, exercise regularly, limit salt intake)
Medication (antidepressants or anxiolytics)
Patient education that stresses that there are numerous techniques that can be used to manage reactions to tinnitus
Stress reduction techniques (eg, imagery, meditation, and deep breathing techniques)
Therapeutic sound (eg, using interesting sound to direct attention away from tinnitus, low-level background sound to reduce auditory contrast, and soothing sound for relief)

NSAIDs, nonsteroidal anti-inflammatory drugs.

Unilateral tinnitus is a red flag

In most cases, tinnitus is bilateral. Unilateral tinnitus may indicate a more serious medical condition. It is a common presenting sign of both vestibular schwannoma (also known as acoustic neuroma) and Meniere’s disease.

Patients with unilateral tinnitus should receive a hearing test as soon as possible; if asymmetric hearing loss is found, MRI is indicated, both with and without contrast of the internal auditory canal, to rule out vestibular schwannoma.

■ **Idiopathic sudden sensorineural hearing loss (ISSNHL)**, which may be associated with new onset unilateral tinnitus, should be considered an otologic emergency. When you suspect ISSNHL, you’ll need to make a same-day referral for an otologic examination.

If left untreated, the ISSNHL and associated tinnitus will resolve partially or completely at least 50% of the time. This recovery rate may be improved with glucocorticoid treatments.¹⁹ Prompt initiation of corticosteroid therapy can be a factor in the chances of recovery—the more rapidly such patients are seen and treated, the better their prognosis.²⁰

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> Idiopathic sudden sensorineural hearing loss should be treated as an otologic emergency.

Tinnitus triage: Key points

Following our triage guide (TABLE 1) should result in appropriate care in most cases. Here are some considerations to keep in mind:

■ **Urgent medical referral.** Any patient with tinnitus and symptoms suggestive of serious underlying treatable pathology requires an urgent otolaryngology referral. That includes ISSNHL, which you should suspect whenever a patient reports an unexplained decrease in hearing, as well as pulsatile tinnitus, vestibular symptoms, and long-standing ear pain, drainage, or malodor that does not resolve with routine treatment. If possible, such patients should undergo an audiologic assessment prior to the otolaryngology visit; however, the otolaryngology exam is the primary concern.

Facial paralysis, severe vertigo, or sudden onset pulsatile tinnitus can indicate a serious intracranial condition. These symptoms may point to cerebrovascular disease or neoplasm, and should be treated as an otologic emergency.

■ **Mental health referral.** Some tinnitus patients require a mental health assessment, either because of obvious manifestations of a mental illness or because of expressed suicidal ideation. If there's a question about the patient's mental health, consider consulting with a mental health provider or using basic screening tools for anxiety and depression to help determine the need for referral, as well as the urgency.¹²

Some patients experience extreme anxiety or depression in response to tinnitus and should be referred to a mental health professional on the day they present with symptoms. Suicidal ideation warrants special attention, of course—possibly including the need to escort the patient to the emergency department or to a behavioral specialist.²¹⁻²³

■ **Nonurgent medical referral.** Ideally, all patients who present with tinnitus should see an audiologist and an otolaryngologist, but those who have no serious symptoms should be referred on a nonurgent basis. Such patients need to have a comprehensive hearing evaluation—ideally, before they see the otolaryngologist so the test results are available at the time of the exam. The audiologist should also assess the severity of the tinnitus,

using a validated questionnaire such as the Tinnitus Handicap Inventory, for the initial assessment and to monitor changes in the severity of the tinnitus as an outcome measure of therapy.²⁴

Enlist an interdisciplinary team

For patients with somatic tinnitus, the treatment—and the specialist who provides it—depends on the underlying cause. A patient who has unilateral tinnitus may be referred by an audiologist or otolaryngologist to a neurologist, for example, if he or she is found to have Meniere's disease; a patient with pulsatile tinnitus may be sent back to his or her primary care physician after diagnostic testing has ruled out serious causes.

For patients with neurophysiologic tinnitus (and any patient with untreatable somatic tinnitus), a well-organized interdisciplinary team that includes the family physician, an audiologist, and a psychologist is the best approach. The variety of available management options (TABLE 2) incorporate medical approaches, complementary and alternative treatments, psychological interventions, and sound-based methods. Lifestyle modifications, such as improved sleep hygiene, regular exercise, and dietary modifications, may help, as well.²⁵⁻²⁷ First-line strategies include:

■ **Adjusting medications.** Eliminating tinnitus-inducing medications, if medically safe, is a common starting point. No prescription drug has been developed specifically for tinnitus. But some antidepressants or anxiolytics (eg, amitriptyline or lorazepam) are commonly used to address coexisting sleep and mental health disorders—primarily depression and anxiety—that may be associated with, or exacerbated by, tinnitus.²⁸⁻³⁰

■ **Addressing hearing problems.** Patients should undergo a hearing evaluation and receive help in managing a hearing problem, if necessary. Hearing aids improve hearing and reduce the perception of tinnitus.³¹

■ **Using therapeutic sound.** Some audiologists are trained to implement various forms of sound-based therapy. Tinnitus retraining therapy involves the use of background sound to facilitate habituation to tinnitus; tinnitus

masking involves the use of soothing sound to provide a sense of relief. Progressive tinnitus management is a more recent method that educates patients in the use of all types of therapeutic sound.³² These sound-based methods often include the use of hearing aids, sound generators, and other devices.

■ Circling in a mental health professional. It is essential to involve psychologists or other mental health specialists in the care of patients with clinically significant tinnitus to ensure that psychological and other barriers to successful management of the condition are identified and addressed. Cognitive-behavioral therapy (CBT) has been shown to be helpful for patients with tinnitus.³³ In fact,

we have been successful in teaching patients to manage their reactions to tinnitus—resulting in a better quality of life—using a combination of educational counseling, therapeutic sound, and CBT. **JFP**

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A good resource for patients is the American Tinnitus Association (www.ata.org).