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Clinical Practice Guideline: Tinnitus Update

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Abstract

Objective. Tinnitus is the perception of sound without an external source. More than 50 million people in the United States have reported experiencing tinnitus, resulting in an estimated prevalence of 10% to 15% in adults. The focus of this guideline is on tinnitus that is both bothersome and persistent (lasting 6 months or longer), which often negatively affects the patient's quality of life. The target audience for the guideline is any clinician, including allied health professionals, involved in managing patients with tinnitus. The target patient population is limited to adults (18 years and older) with tinnitus that is persistent and bothersome.

Purpose. The purpose of this guideline is to provide and update evidence-based recommendations for clinicians managing patients with tinnitus. This guideline provides clinicians with a logical framework to improve patient care and mitigate the personal and social effects of persistent, bothersome tinnitus. It discusses the evaluation of patients with tinnitus, including selection and timing of diagnostic testing and specialty referral to identify potential underlying treatable pathology. It then focuses on the treatment of patients with persistent tinnitus, with recommendations to guide the measurement of the effect of tinnitus and to determine the most appropriate interventions to improve symptoms and quality of life for people with tinnitus and associated comorbidities.

Methods. This guideline was developed using the 55-page protocol published as the American Academy of Otolaryngology–Head and Neck Surgery Foundation's *Clinical Practice Guideline Development Manual* (3rd edition),

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which summarizes the methodology for assessments of current data, topic prioritization, development of key action statements (KASs), application of value judgments, and related procedures. The guideline group was represented by adult otolaryngologists, audiologists, otologists/neurotologists, a geriatrician, a behavioral neuroscientist, a neurologist, a radiologist, a psychiatrist, an internist, a nurse practitioner, an otolaryngology resident physician, and a consumer advocate who represented participating, national professional organizations.

Action Statements. The Guideline Update Group made *strong recommendations* for the following Key Action Statements (KAS): Clinicians should distinguish patients with bothersome tinnitus from patients with non-bothersome tinnitus (KAS 2). Clinicians should inquire about risks for self-harm in a patient with bothersome tinnitus (KAS 3). Clinicians should not obtain neuroradiologic imaging in patients with tinnitus specifically to evaluate the tinnitus unless specific concerning features are present (KAS 6). The Guideline Update Group made *recommendations* for the following KASs: Clinicians should perform a targeted history and physical examination at the initial evaluation of a patient with tinnitus (KAS 1). Clinicians should obtain a comprehensive audiological evaluation in patients with tinnitus (KAS 5). Clinicians should educate patients with tinnitus about the natural history and effects of, and management strategies for tinnitus (KAS 7). Clinicians should recommend a hearing aid evaluation for patients with hearing difficulties and persistent, bothersome tinnitus (KAS 8). Clinicians should refer patients with persistent, bothersome tinnitus for cochlear implant evaluation when they meet audiologic criteria for referral (KAS 9). Clinicians should recommend Cognitive Behavioral Therapy (CBT) to patients with persistent, bothersome tinnitus (KAS 11). Clinicians or their designee should assess and document outcomes of interventions in patients with persistent, bothersome tinnitus (KAS 15). The Guideline Update Group made *recommendations against* for the following KASs: Clinicians should not routinely recommend antidepressants, anticonvulsants, anxiolytics, or intratympanic medications for a primary indication of treating persistent, bothersome tinnitus (KAS 12). Clinicians should not recommend dietary supplements for the primary indication of persistent, bothersome tinnitus (KAS 13). Clinicians should not recommend repetitive transcranial magnetic stimulation (rTMS) for the treatment of patients with persistent, bothersome tinnitus (KAS 14A). The Guideline Update Group offered *options* for the following KASs: Clinicians may inquire about somatosensory features in patients with persistent, bothersome tinnitus (KAS 4). Clinicians may recommend sound enrichment to patients with persistent, bothersome tinnitus (KAS 10). Clinicians may offer bimodal neuromodulation to patients with persistent, bothersome tinnitus (KAS 14B).

Keywords

clinical practice guideline, evidence-based practice, novel data, systematic reviews, tinnitus

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Differences from Prior Guideline

This clinical practice guideline is an update of, and replacement for, a guideline published in 2014 by the American Academy of Otolaryngology–Head and Neck Surgery Foundation (AAO-HNSF). An update was planned for 10 years after the initial publication date and was further necessitated by new primary studies and systematic reviews that suggest a need for modifying clinically important recommendations. Changes in content and methodology from the prior guidelines include the following:

- New evidence from 28 sets of guidelines, 223 systematic reviews, and 362 RCTs.
- Enhanced external review process to include public comment and journal peer review.
- Five new KASs on *self-harm*, *somatosensory tinnitus*, *cochlear implantation*, *bimodal neuromodulation*, and *follow-up*.
- Removal of two KASs: (1) identification of persistent tinnitus, as it is defined in the guideline scope and (2) treatment of tinnitus with acupuncture (previously no recommendation).
- Removal of terminology of *primary* versus *secondary* tinnitus.
- One KAS has been updated, changing the term *sound therapy* to *sound enrichmen*t to better reflect the recommended interventions.
- New algorithm to clarify action statement relationship.

Tinnitus is the perception of sound without an external source. Not a disease in and of itself, tinnitus is a symptom that can be associated with multiple causes and aggravating co-factors. More than 50 million people in the United States have reported experiencing tinnitus, with about 1 in 10 adults affected in any given year.[1-3]

About 50% of adults who experience tinnitus will discuss it with a health care clinician and 20% will pursue clinical intervention.[1] Tinnitus was the most prevalent service-connected disability for US military veterans receiving compensation at the end of fiscal year 2024,

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resulting in nearly 3 million veterans receiving disability awards.[4] Tinnitus is relatively common, and in rare cases it can be a symptom of serious disease such as vestibular schwannoma (VS) or vascular tumor.

Tinnitus can be perceived as coming from one or both ears, from within or outside the head. The sound quality of tinnitus can vary, with ringing, whistling, buzzing, hissing, chirping, roaring, clicking, pulsations, and other noises described by tinnitus patients. The auditory perception of tinnitus may be constant or intermittent. Most tinnitus is subjective, perceived only by the patient. Objective tinnitus is generated by a sound source in the body, such as blood flow or muscle contraction, and may be perceived by others.[5] The subjective nature of most tinnitus can make the assessment of clinical outcomes challenging.

The effects of tinnitus on health-related quality of life (QOL), or how *bothersome* it is, also vary widely. Although most patients report minimal tinnitus intrusiveness, some experience substantial distress, anxiety, depression, and even suicidal ideation.[6,7] From the recognition that tinnitus has both perceptual and reactive components came a proposal for a new diagnostic entity, *Tinnitus Disorder*, describing when the auditory perception of tinnitus becomes "associated with emotional distress, cognitive dysfunction, and/or autonomic arousal, leading to behavioral changes and functional disability".[8] Comorbid conditions, including hearing loss and psychiatric disorders, also contribute to the burden experienced by patients with tinnitus. Clinicians should remain mindful of the multiple facets of the tinnitus burden during the clinical evaluation and should also consider which facets are targeted by any given intervention to optimize outcomes and so that expectations align. In particular, it is important to consider if a given management strategy targets the sensation of tinnitus (the sound itself) or reactions to and the effects of tinnitus. The focus of this guideline is tinnitus that is bothersome and persistent. The guideline update group (GUG) chose 6 months as the criterion to define persistent or chronic tinnitus, since this duration was used most often as an entry threshold in published research studies on tinnitus. However, more recent studies have used tinnitus of 3 months duration for eligibility. The recommendations of this updated clinical practice guideline (CPG) may be applicable to patients with tinnitus of shorter duration than 6 months. The definitions of key terms used in this guideline are provided in **Table 1**.

A wide range of therapies has been used and studied in efforts to provide symptomatic relief for people with tinnitus. These therapies include education and counseling, auditory therapies such as hearing aids, cochlear implants (CI), and specific forms of sound enrichment, Cognitive Behavior Therapy (CBT), medications, dietary supplements, and neuromodulation with transcranial magnetic stimulation (TMS) and bimodal stimulation devices. Based on the heterogeneity of the condition, no one intervention is expected to have the same effectiveness for every patient. Nevertheless, there is substantial variation in the care received among patients who seek healthcare for tinnitus, both in terms of interventions offered and adherence to published clinical guidelines.[1]

This updated guideline provides actionable recommendations to improve the quality of care that tinnitus patients receive, based on current best research evidence and multidisciplinary consensus. The guideline recommendations will assist clinicians in managing patients with tinnitus, emphasizing interventions and therapies deemed beneficial, and avoiding those that are time-consuming, costly, inaccessible, and ineffective.

Guideline Scope and Purpose

The purpose of this guideline is to provide and update evidence-based recommendations for clinicians managing patients with tinnitus. The target audience for this guideline is any clinician involved in managing patients with tinnitus. People with tinnitus may be evaluated by a variety of healthcare clinicians, including primary care clinicians, specialty clinicians, and allied health professionals including audiologists and clinical psychologists. The target patient population is limited to adults (18 years and older) with tinnitus that is persistent and bothersome.

Most people with tinnitus have associated hearing loss, such as sensorineural hearing loss (SNHL) secondary to

Table 1. Abbreviations and Definitions of Common Terms

Term	Definition
Tinnitus	The perception of sound when there is no external source of the sound
Recent onset (or acute) tinnitus	Less than 6 months[a] in duration (as reported by the patient)
Persistent (or chronic) tinnitus	6 months or longer in duration[a]
Bothersome tinnitus	Tinnitus that causes distress, affects quality of life,[b] and/or functional health status; patient is seeking active therapy and management strategies to alleviate tinnitus
Non-bothersome tinnitus	Tinnitus that does not have a significant effect on a patient's quality of life but may result in curiosity about the cause or concern about the natural history and how it may progress or change

[a]Some clinicians and investigators advocate for using 3 months as the cutoff for recent onset/acute and persistent/chronic tinnitus.
[b]*Quality of life* is the degree to which persons perceive themselves as able to function physically, emotionally, mentally, and/or socially.

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aging (presbycusis), noise exposure (noise-induced hearing loss), or acoustic trauma. Tinnitus can also be a symptom of numerous auditory and nonauditory system disorders, ranging from middle ear diseases, such as otosclerosis and eustachian tube dysfunction, to inner ear and auditory nerve pathologies such as Ménière's disease and VS. Nonauditory system disorders that can cause tinnitus include vascular anomalies, myoclonus, and intracranial hypertension.

The GUG placed emphasis on the need for thorough clinical evaluation to identify these potentially treatable and sometimes serious disorders. However, *patients with identifiable causative diagnoses other than sensorineural hearing loss (SNHL) are excluded from this guideline* as they are excluded from nearly all randomized controlled trials of tinnitus management, making it impossible to generalize trial results to these patients. *Nevertheless, clinicians should decide whether to apply the recommendations of this guideline to patients with these conditions on an individualized basis*.

The guideline also underscores the need to distinguish between subjective, objective, and pulsatile tinnitus to further direct patient evaluation and management. Comprehensive management of objective tinnitus and pulsatile tinnitus is not within the scope of this guideline. Pulsatile tinnitus is the perception of a rhythmic sound in the absence of an external source that may be pulse-synchronous, which is often but not always related to vascular causes, or pulse-asynchronous, which is typically associated with mechanical causes such as palatal or middle ear myoclonus.[9] Further, the guideline does not apply to transient ear noise, which is the sudden perception of a tonal or ringing sound in one ear, lasting fewer than 5 minutes, that may be accompanied by a sense of hearing loss or aural fullness, as it does not typically require clinical management.[4] The guideline also excludes patients with tinnitus related to complex auditory hallucinations or hallucinations related to psychotic or seizure disorders.

This is an update to an evidence-based clinical practice guideline developed for the evaluation and management of tinnitus. This updated guideline provides clinicians with a logical framework to improve patient care and mitigate the personal and social effects of persistent, bothersome tinnitus. The first part of the guideline is focused on the clinical evaluation of patients with tinnitus, including the history, physical exam, and selection and timing of diagnostic testing and specialty referral to identify potential underlying treatable pathology and reduce the risk of self-harm. The remainder of the guideline is focused on the evaluation and treatment of patients with persistent, bothersome tinnitus, with recommendations to evaluate and measure its effects as well as to determine the most appropriate interventions to improve symptoms and QOL.

In formulating this guideline, the GUG identified a broad range of topics as quality improvement opportunities for the development of recommendations. These topics fall into the 3 broad domains of assessment, intervention/management, and clinician and patient education (**Table 2**). The group further prioritized these topics based on the published evidence, considerations of potential benefits and harms, and the collective expertise of the working group to determine which of them would be a focus of the guideline update.

Healthcare Burden

Prevalence

Tinnitus affects an estimated 10% to 15% of adults worldwide, although only 1% to 2% of individuals report it as severely bothersome or disabling.[3,10,11] The prevalence appears consistent across geographic regions, including North America, Europe, Asia, and Africa.[12] The likelihood of developing tinnitus increases with age and is similar between men and women.[3,10,11] Roughly half of people with tinnitus experience bilateral tinnitus.[13] Among those with unilateral tinnitus, left-sided symptoms are more frequently reported than right-sided, although the clinical relevance of this asymmetry remains unclear.[13] The prevalence of tinnitus among children is lower, but not negligible, particularly among those with otologic disorders or noise exposure, highlighting the importance of early hearing conservation strategies.[13]

Natural History

Tinnitus severity may fluctuate over time. While some individuals experience a gradual reduction in intrusiveness and report diminished distress, others continue to find the condition intrusive or even worsening.[5] Longitudinal studies suggest that spontaneous resolution occurs in some patients. For example, the Blue Mountain Hearing Study reported complete resolution in 18% of cases over 5 years.[14] Similarly, in a large UK Biobank sample, resolution was reported by 18% over an average of 4 years; when persistent, the bothersomeness of the tinnitus was unchanged for 82%, and improvement (bothersome to nonbothersome) and worsening (non-bothersome to bothersome) occurred in equal proportions (9%).[15] A meta-analysis of outcomes among participants allocated to the no-intervention or waiting-list control groups in tinnitus trials found small but statistically significant improvements in scores of self-reported global tinnitus severity, however there was high inter-individual variation.[16] Spontaneous tinnitus resolution and variation emphasize the need for placebo control in tinnitus trials.

Symptom resolution is more common among those with initially mild tinnitus, with one study showing 40% resolution for mild tinnitus compared to 20% for severe cases.[17] Among individuals with tinnitus onset concomitant with sudden sensorineural hearing loss, tinnitus resolved within 3 months in 65% of individuals with mild-to-moderate hearing loss compared to only 23% of those with severe hearing loss.[18] Symptom

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Table 2. Topics and Issues Considered in Tinnitus Guideline Development[a]

Topic	Issue
Assessment	• How should patients who first present with tinnitus be evaluated? • What is the initial evaluation of patients with recent onset tinnitus? • What is the initial evaluation of patients with persistent tinnitus? • Should all patients with tinnitus have an audiologic evaluation? • What is the relationship between hearing loss and tinnitus? • Can the level and type of hearing loss associated with tinnitus be identified? • Which patients with tinnitus require diagnostic tests and evaluation? • How should clinicians distinguish bothersome tinnitus from non-bothersome tinnitus? • What are the best methods/instruments for evaluating the severity of tinnitus and the effects of treatment? • How should patients be triaged according to tinnitus severity? • When should a patient with tinnitus be referred for specialty evaluation (psychiatry clinicians, audiology, emergency care, or otolaryngology)? • What is the natural history of recent onset tinnitus? What should patients expect? • How should clinicians distinguish primary tinnitus (tinnitus that is idiopathic or associated with sensorineural hearing loss) from secondary tinnitus (tinnitus that is associated with a specific underlying cause or condition, other than sensorineural hearing loss)? • Are certain patients with 1 or more chronic conditions (eg, depressive disorders) at increased risk for tinnitus? How might this affect management? • Can modulating factors (eg, sleep apnea, allergies, medication use) be identified that exacerbate or alleviate tinnitus?
Intervention/management	• What is the role of medical therapy in managing persistent, bothersome tinnitus? • What is the effectiveness of cognitive behavioral therapy for persistent, bothersome tinnitus? • What is the role of hearing aids and other forms of sound enrichment (maskers, modulated music) in the treatment of tinnitus with and without associated hearing loss? • What is the role of complementary and alternative medicine in managing tinnitus? • What is the role of over-the-counter therapies in managing tinnitus? • What is the effectiveness of Ginkgo biloba for persistent, bothersome tinnitus? • What is the effectiveness of acupuncture for persistent, bothersome tinnitus? • What is the effectiveness of transcranial magnetic stimulation for persistent, bothersome tinnitus? • Are there particular therapies that patients should avoid because they may promote false hope? • Are some treatments for tinnitus harmful? • What can patients do for relief of bothersome, recent onset tinnitus, recognizing that most therapies have been studied only for persistent tinnitus? • What is the best way for specialists to communicate with primary care clinicians in managing patients with tinnitus? • How should clinicians manage patients with tinnitus and modify conditions such as hyperlipidemia, high cholesterol, migraine, depressive disorder, etc.? • What is the association of tinnitus with other medical conditions such as anxiety and depressive disorders, hyperlipidemia, hypercholesterolemia, migraine, etc.?
Education	• How should clinicians be educated that tinnitus can be managed and avoid attitudes and statements such as "you just have to live with it"? • How can patients be counseled about expectations of therapy and avoiding unproven therapies with potential harm or cost? • What education and counseling should clinicians provide to patients with bothersome, recent onset tinnitus? • What education and counseling should clinicians provide to patients with persistent tinnitus?

[a]GUG members prioritized topics and not all were addressed in the guideline update.

resolution or improvement is less common among those with ongoing hearing difficulties.[15] Importantly, the likelihood of resolution or improvement may depend not only on the underlying etiology but also on individual psychological traits, cognitive appraisal, and environmental factors, all of which highlight the importance of a biopsychosocial approach to counseling and management.

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Association with Other Conditions

Tinnitus can result from any disorder that disrupts the auditory pathway. Common associations include presbycusis (age-related hearing loss), noise-induced hearing loss, and acoustic trauma.[19] Tinnitus may serve as an early warning sign of cochlear damage from acute or chronic noise exposure.[20] In some cases, treatment of the underlying condition, such as removal of impacted cerumen or resolution of a middle ear effusion, can lead to symptom improvement or resolution.[5]

Once tinnitus is established, nonauditory pathways-including attentional, emotional, and somatosensory circuits play a key role in determining its perceptual salience and the degree of associated distress. Notably, the perceived loudness of tinnitus is poorly correlated with how bothersome it is.[21] Tinnitus loudness matched to an external signal may be relatively loud yet not cause distress in one patient and be relatively soft and cause extreme distress in another. This discrepancy may reflect central mechanisms related to attention, emotional processing and salience attribution.

Tinnitus is also frequently comorbid with non-auditory disorders. These include: temporo-mandibular joint disorder (TMD), cervical spine dysfunction, migraine, insomnia, and depressive and anxiety disorders.[17,22,23] Among patients with tinnitus, up to 33% may meet criteria for major depressive disorder.[24] Sleep disturbances are reported by more than half of patients and can amplify emotional distress and cognitive impairment.[25]

A distinctive common subtype, somatosensory tinnitus (aka, somatic tinnitus or somatically-modulated tinnitus), occurs when head, neck, jaw, or even eye movement modulates the pitch or loudness of the perceived sound. This suggests convergence between somatosensory and auditory pathways. Population-based studies have shown that patients with TMD are at increased risk of tinnitus, further supporting this cross-modal mechanism.[26]

Impact on Health-Related Quality of Life

Tinnitus can have profound effects on quality of life. Commonly reported difficulties include sleep disturbance, poor concentration, impaired speech perception in noisy environments and reduced social engagement.[27,28] The persistent presence of an uncontrollable, intrusive sound may generate feelings of frustration, helplessness, and irritability. Psychiatric comorbidity is frequent; cross-sectional studies have identified strong associations of tinnitus with both anxiety and depressive disorders.[29,30] Tinnitus can exacerbate existing psychiatric disorders or contribute to their onset, particularly when sleep is disrupted.[25,31] Given the heterogeneity in psychological responses to tinnitus, individualized management (eg, CBT) may be critical to improve coping and reduce functional impairment.

Economic Burden

Tinnitus imposes a significant economic burden through both direct and indirect costs. Direct medical costs include outpatient visits, audiologic assessments, imaging, and treatments. Indirect costs stem from lost productivity, occupational limitations, and work-related disability.

In the US, tinnitus is the most prevalent service-connected disability among veterans, with nearly 3 million individuals receiving compensation.[4] In Europe, annual direct health care costs for tinnitus have been estimated to range from €1500 to €2200 per patient (approximately $1727 USD to $2533 USD), and indirect costs, primarily from productivity loss, range from €2300 to €3700 per patient (approximately $2648 USD to $4261 USD)[32] These figures underscore the importance of prevention strategies, early identification of high-risk individuals and accessible, evidence-based treatment options.

Methods

In developing this update of the evidence-based clinical practice guideline, the methods outlined in the AAO-HNSF *Guideline Development Manual* (*3rd edition*) were followed explicitly.[33]

The original KASs from the "Clinical Practice Guideline: Tinnitus"[34] were sent to a panel of expert reviewers from the field of otolaryngology, audiology, otology, neurotology, geriatrics, neurology, radiology, psychiatry, and family practice who were asked to assess the key action statements (KAS) in the original guideline and recommend if they should be kept as is, amended, or removed based on relevancy, omissions, or controversies that the guideline spurred, and any new literature or treatments that might affect the guideline recommendations. The reviewers concluded that the original guideline action statements remained valid but should be updated with modifications. Suggestions were also made for new key action statements (KAS).

Literature Search and Selection

An information specialist conducted 2 rounds of literature searches to first identify CPGs and SRs, and later, RCTs using the Cochrane Highly Sensitive Search Strategy for RCTs, sensitivity- and precision-maximizing version. Results were limited to English language articles published between the years 2014 and 2025. The following databases were searched for relevant studies: PubMed, Embase, CINAHL, Scopus, ProQuest Central, BIOSIS, and the Cochrane Database of Systematic Reviews. Supplemental searches were conducted on the websites of ECRI Guidelines Trust, Guideline Central, Guidelines International Network, National Institute for Health and Care Excellence (NICE), Scottish Intercollegiate Guidelines Network (SIGN), AHRQ Evidence-Based Reports, NLM Health Services/Technology Assessment Texts (HSTAT), International HTA Database (INAHTA), NIHR Centre for Reviews and Dissemination,

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Cochrane CENTRAL, ClinicalTrials.gov, the WHO International Clinical Trials Registry Platform (ICTRP), TRIP Database, and Google Scholar.

The initial English-language searches identified 43 CPGs, 322 SRs, 13 Meta-Analyses, and 681 RCTs published in 2014 or later. CPGs were included if they met the quality criteria of: (a) an explicit scope and purpose, (b) multidisciplinary stakeholder involvement, (c) systematic literature review, (d) explicit system for ranking evidence, and (e) explicit system for linking evidence to recommendations. SRs were included if they met the quality criteria of: (a) clear objective and methodology (eg, adherence to PRISMA guidelines), (b) explicit search strategy, (c) valid data extraction methods, and (d) data analysis with risk of bias assessment, where appropriate. RCTs were included if they met the quality criteria of: (a) trials involved study randomization, (b) trials were described as double-blind, and (c) trials denoted a clear description of withdrawals and dropouts of study participants. After removing duplicates, irrelevant references, and non-English-language articles, the GUG retained 28 CPGs, 223 SRs, 5 Meta-Analyses, and 362 RCTs that met inclusion criteria. Additional background evidence included observational cohort, case control, and cross-sectional studies as needed, to supplement the systematic reviews or to fill gaps when a review was not available.

Classification of Evidence-Based Statements

CPGs and guideline updates are intended to produce optimal health outcomes for patients, to minimize harm, and to reduce inappropriate variations in clinical care. The evidence-based approach to guideline development requires the evidence supporting a policy to be identified, appraised, and summarized, and that an explicit link between evidence and KASs be defined. Evidence-based statements reflect both the *quality of evidence* and the *balance of benefit and harm* that is anticipated when the statement is followed. **Table 3** defines the grades of aggregate evidence[35] and **Table 4** defines the strength of action (obligation) based on the interaction of evidence grade and benefit-harm balance.[36]

Guidelines are not intended to supersede professional judgment; rather, they may be viewed as a relative constraint on individual clinician discretion in a particular clinical circumstance. Less frequent variation in practice is expected for a *strong recommendation* than might be expected with a *recommendation*. *Options* offer the most opportunity for practice variability.[36] Clinicians should always act and decide in a way that they believe will best serve their patient's interests and needs, regardless of guideline recommendations. They must also operate within their scope of practice and according to their training. Guidelines represent the best judgment of a team of experienced clinicians and methodologists addressing scientific evidence for a particular topic.[36]

Making recommendations about health practices involves value judgments on the desirability of various outcomes associated with management options. Values applied by the GUG sought to minimize harm and diminish unnecessary and inappropriate therapy. A major goal of the GUG was to be transparent and explicit about how values were applied and to document the process by explicitly stating value judgements as an element of each of the KAS profiles.

Stakeholder Involvement

The Guideline Update Group (GUG) consisted of 20 panel members representing adult otolaryngologists, audiologists, otologists/neurotologists, a geriatrician, a behavioral neuroscientist, a neurologist, a radiologist, a psychiatrist, an internist, a nurse practitioner, an otolaryngology resident physician, and a consumer advocate. The GUG engaged in three conference calls and one in-person meeting, during which they defined the scope and objectives of the guideline, reviewed comments from the expert panel review for each key action statement, identified other quality improvement opportunities, reviewed literature search results, and then drafted, critiqued, and revised a document shared with live updates accessible to all members in real time.

Development of Key Action Statements

The KASs were developed following the two literature searches and the assessment of the evidence. The GUG proposed topics within the scope of the guideline supported by the evidence and where there is perceived gap in care or quality improvement opportunity. The evidence profile for each KAS from the 2014 guideline was updated with additional components to ensure consistency with the current AAO-HNSF guideline methodology.[33] Additionally, a new domain was added to each evidence profile directly addressing implementation considerations for each KAS. The GUG also updated quality improvement opportunities, specifically linking them to quality improvement domains.

New KASs were developed with an explicit and transparent *a priori* protocol for creating actionable statements based on supporting evidence and the associated balance of benefit and harm. Electronic decision support software (BRIDGE-Wiz; Yale Center for Medical Informatics) was used to facilitate the creation of actionable recommendations and evidence profiles.[38]

AAO-HNSF staff used the GuideLine Implementability Appraisal (GLIA) to assess adherence to methodologic standards, to improve clarity of recommendations, and to predict potential obstacles to implementation.[39] The GUG received summary appraisals and modified an advanced draft of the guideline update based on the appraisal. The guideline update then underwent extensive peer review from a group of stakeholders, as well as a period of open public comment. Revisions to the manuscript were made to address the comments from peer review and the public.

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Table 3. Strength of Action Terms in Guideline Statements and Implied Levels of Obligation

Strength	Definition	Implied obligation
Strong Recommendation	A strong recommendation means the benefits of the recommended approach clearly exceed the harms (or, in the case of a strong negative recommendation, that the harms clearly exceed the benefits) and that the quality of the supporting evidence is high (Grade A or B).[a] In some clearly identified circumstances, strong recommendations may be made based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits strongly outweigh the harms.[37]	Clinicians should follow a strong recommendation unless a clear and compelling rationale for an alternative approach is present.
Recommendation	A recommendation means the benefits exceed the harms (or, in the case of a negative recommendation, that the harms exceed the benefits), but the quality of evidence is not as high (Grade B or C).[a] In some clearly identified circumstances, recommendations may be made based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits outweigh the harms.	Clinicians should also generally follow a recommendation but should remain alert to new information and sensitive to patient preferences.
Option	An option means that either the quality of evidence is suspect (Grade D)[a] or that well-done studies (Grade A, B, or C)[a] show little clear advantage to one approach versus another.	Clinicians should be flexible in their decision making regarding appropriate practice, although they may set bounds on alternatives; patient preference should have a substantial influencing role.

[a]See **Table 4** for definitions of evidence grades.

Finally, the guideline update was subject to journal editorial peer review. A scheduled review process will occur 5 to 10 years from publication or sooner if new compelling evidence warrants earlier consideration.

The final draft of the updated clinical practice guideline was revised based on comments received during multidisciplinary peer review, open public comment, and editorial peer review. The recommendations contained in the guideline are based on the best available published data through March 2025. Where data were lacking, a combination of clinical experience and expert consensus was used. A scheduled review process will occur at 5 to 10 years from publication or sooner if new compelling evidence warrants earlier consideration.

Financial Disclosure and Conflicts of Interest

The cost of developing this guideline, including travel expenses of all panel members, was covered in full by the AAO-HNS Foundation. Potential conflicts of interest for all panel members in the past 5 years were compiled and distributed before the first conference call. After review and discussion of these disclosures[40] the panel concluded that individuals with potential conflicts could remain on the panel if they: (1) Reminded the panel of potential conflicts before any related discussion, (2) recused themselves from a related discussion if asked by the panel, and (3) agreed not to discuss any aspect of the guideline with industry before publication. Lastly, panelists were reminded that conflicts of interest extend beyond financial relationships, and may include personal experiences, how a participant earns a living, and the participant's previously established "stake" in an issue.[41]

Guideline Key Action Statements

Each evidence-based statement is organized in a similar fashion: Each KAS is shown in bold, followed by the strength of the recommendation in italics. Each KAS is followed by an "action statement profile" that explicitly states the quality improvement opportunity, aggregate evidence quality, level of confidence in evidence (high, medium, low), benefits, harms, risks, costs and a benefits-harm assessment. Additionally, there are statements describing any value judgments, the role of patient preferences, clarification of any intentional vagueness by the panel, exceptions to the statement, any differences of opinion, and a supporting statement about the strength of the recommendation. Several paragraphs subsequently discuss the evidence supporting the statement. An overview of each evidence-based statement in this guideline can be found in **Table 5**. It should be emphasized that the order of key action statements in the guideline is not intended to represent the necessary order of clinical actions. The relationship between statements, or "clinical flow," is represented in **Figure 1**.

For the purposes of this guideline, *shared decision-making* refers to the exchange of information regarding treatment risks and benefits, as well as the expression of patient preferences and values, which result in mutual responsibility in decisions regarding treatment and care.[42]

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Table 4. Evidence Quality for Grades of Evidence

Grade	OCEBM level	Treatment	Harm	Diagnosis	Prognosis
A	1	Systematic review[a] of randomized trials	Systematic review[a] of randomized trials, nested case-control studies, or observational studies with dramatic effect[a]	Systematic review[a] of cross-sectional studies with consistently applied reference standard and blinding	Systematic review[a] of inception cohort studies[b]
B	2	Randomized trials, or observational studies with dramatic effects or highly consistent evidence	Randomized trials, or observational studies with dramatic effects or highly consistent evidence	Cross-sectional studies with consistently applied reference standard and blinding	Inception cohort studies[b]
C	3-4	Nonrandomized or historically controlled studies, including case-control and observational studies	Non-randomized controlled cohort or follow-up study (postmarketing surveillance) with sufficient numbers to rule out a common harm; case-series, case-control, or historically controlled studies	Nonconsecutive studies, case-control studies, or studies with poor, nonindependent, or inconsistently applied reference standards	Cohort study, control arm of a randomized trial, case series, or case-control studies; poor quality prognostic cohort study
D	5	Case reports, mechanism-based reasoning, or reasoning from first principles			
X	n/a	Exceptional situations where validating studies cannot be performed and there is a clear preponderance of benefit over harm			

Abbreviation: OCEBM, Oxford Centre for Evidence-Based Medicine.
Adapted from Howick and colleagues.
[a]A systematic review may be downgraded to level B because of study limitations, heterogeneity, or imprecision.
[b]A group of individuals identified for subsequent study at an early, uniform point in the course of the specified health condition, or before the condition develops.

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Table 5. Summary of Guideline Key Action Statements

Statement	Action	Strength
1. History and Physical Exam	Clinicians should perform a targeted history and physical examination at the initial evaluation of a patient with tinnitus to identify conditions that if promptly identified and managed may relieve tinnitus.	Recommendation
2. Bothersome Tinnitus	Clinicians should distinguish patients with bothersome tinnitus from patients with non-bothersome tinnitus.	Strong Recommendation
3. Self-Harm	Clinicians should inquire about risks for self-harm in a patient with bothersome tinnitus.	Strong Recommendation
4. Somatosensory	Clinicians may inquire about somatosensory features in patients with persistent, bothersome tinnitus.	Option
5.Audiological Exam	Clinicians should obtain a comprehensive audiological evaluation in patients with tinnitus.	Recommendation
6. Imaging Studies	Clinicians should not obtain neuroradiologic imaging in patients with tinnitus specifically to evaluate the tinnitus unless they have one or more of the following: tinnitus that localizes to one ear, pulsatile tinnitus, focal neurological abnormalities, or asymmetric hearing loss.	Strong Recommendation against
7. Education and Counseling	Clinicians should educate patients with tinnitus about the natural history and effects of, and management strategies for tinnitus.	Recommendation
8. Hearing Aid Evaluation	Clinicians should recommend a hearing aid evaluation for patients with hearing difficulties and persistent, bothersome tinnitus.	Recommendation
9. Cochlear Implant	Clinicians should refer patients with persistent, bothersome tinnitus for cochlear implant evaluation when they meet audiologic criteria for referral.	Recommendation
10. Sound Enrichment	Clinicians may recommend sound enrichment to patients with persistent, bothersome tinnitus.	Option
11. Cognitive Behavioral Therapy	Clinicians should recommend Cognitive Behavioral Therapy (CBT) to patients with persistent, bothersome tinnitus.	Recommendation
12. Therapy with Medicines	Clinicians should not routinely recommend antidepressants, anticonvulsants, anxiolytics, or intratympanic medications for a primary indication of treating persistent, bothersome tinnitus.	Recommendation against
13. Dietary Supplements	Clinicians should not recommend dietary supplements for the primary indication of persistent, bothersome tinnitus.	Recommendation against
14A. Repetitive Transcranial Magnetic Stimulation (rTMS)	Clinicians should not recommend rTMS for the treatment of patients with persistent, bothersome tinnitus.	Recommendation against
14B. Bimodal Stimulation	Clinicians may offer bimodal neuromodulation to patients with persistent, bothersome tinnitus.	Option
15. Follow-up/Outcomes	Clinicians or their designee should assess and document outcomes of interventions in patients with persistent, bothersome tinnitus.	Recommendation

Involving patients in management decisions through shared decision-making can decrease decisional conflict and regret, influence health care utilization, and provide an individualized aspect to evidence-based care.[43-45]

Statement 1: History and Physical Exam

Clinicians should perform a targeted history and physical examination at the initial evaluation of a patient with tinnitus to identify conditions that if promptly identified and managed may relieve tinnitus.

Evidence Strength: *Recommendation based on observational studies, with a preponderance of benefit over harm.*

Action Statement Profile: 1

- **Quality improvement opportunity:** To promote a consistent and systematic approach to the initial evaluation of the patient with tinnitus.
- **Aggregate evidence quality:** Grade C, based on observational studies.
- **Level of confidence in evidence:** Medium, as few if any studies specifically investigate the diagnostic yield or impact of history and examination on tinnitus patients.
- **Benefits:** Identify potentially treatable, underlying causes and co-morbid conditions; minimize cost and administrative burden through a targeted approach

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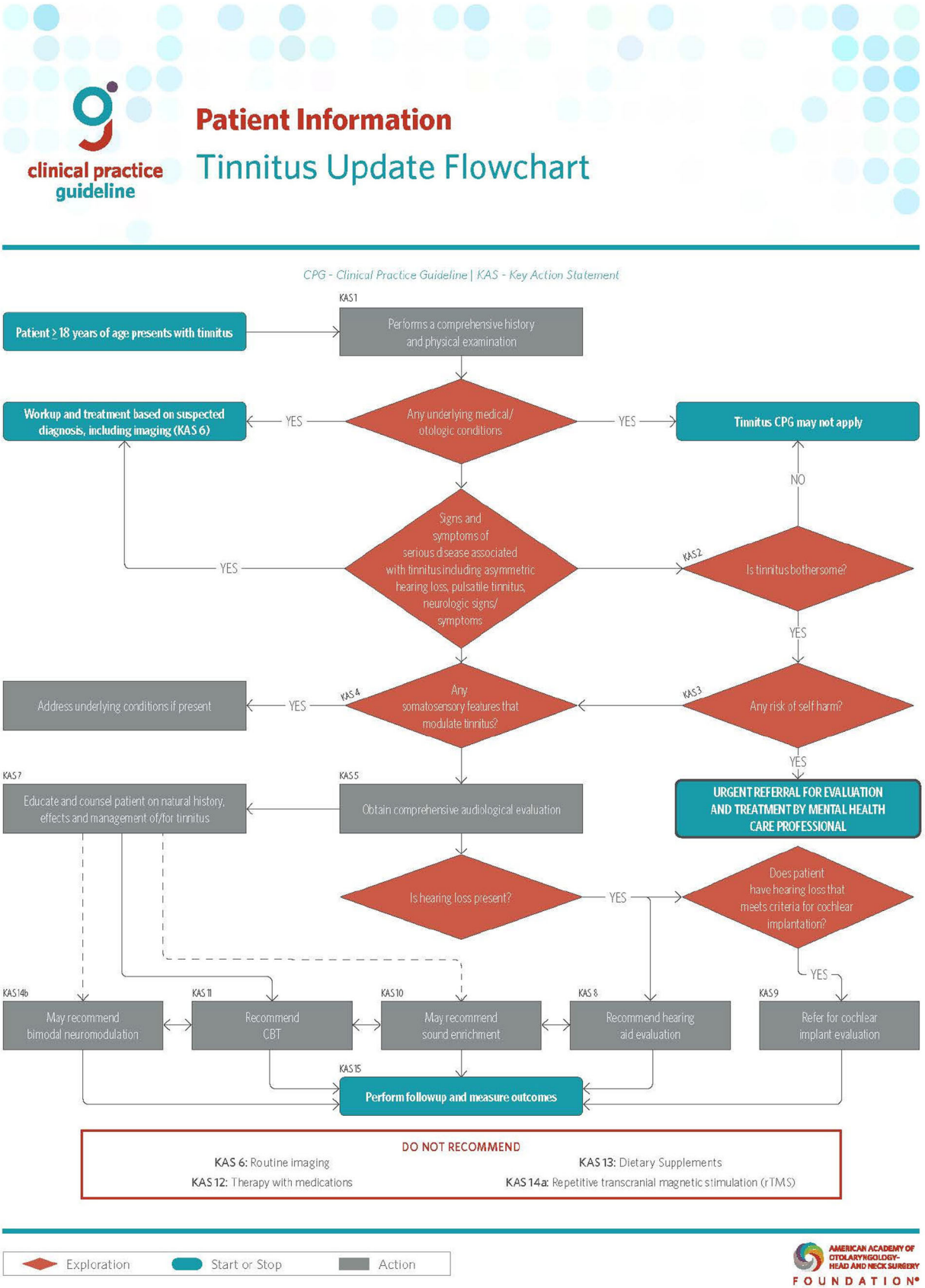


Figure 1. Algorithm showing the interrelationship of guideline key action statements.

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to history and physical examination; streamline care/increase efficiency; improve patient satisfaction; identify patients with tinnitus who may benefit from further management (as outlined in this guideline).
- **Risks, harms, costs:** None.
- **Benefit-harm assessment:** Preponderance of benefit over harm.
- **Value judgments:** Perception by the GUG that people experiencing tinnitus may not receive thorough, consistent evaluations from clinicians; further perception that many clinicians are unaware of the optimal targeted history and physical examination to evaluate a patient with tinnitus.
- **Intentional vagueness:** The definition of a "targeted" history and physical examination is elaborated upon in the supporting text.
- **Role of patient preferences:** None.
- **Exceptions:** None.
- **Policy level:** Recommendation.
- **Differences of opinion:** None.
- **Changes from 2014 guidelines:** The target patient for this recommendation was changed from a patient with "presumed primary tinnitus" to any patient with tinnitus, as the GUG felt that any patient with tinnitus could benefit from a targeted history and examination.
- **Implementation Considerations:** None.

Supporting Text

The purpose of this statement is to emphasize the importance of completing a history and physical examination to identify potentially treatable causes of tinnitus as well as to identify serious conditions that may cause or accompany tinnitus. An appropriate clinical evaluation should occur early to direct the need for and the type of additional testing and treatment. There is a complex relationship among tinnitus, physical health, and psychological health, thus a comprehensive diagnostic approach will improve overall tinnitus management. Clinicians who evaluate patients with tinnitus should characterize the tinnitus and document the presence or absence of certain symptoms and coexisting physical or psychiatric conditions that dictate the need for further referral to otolaryngology, audiology, neurology, physical therapy, psychiatry, and/or related specialties. These key symptoms, signs, and conditions are listed in **Tables 6** and **7**.

Tinnitus History

The tinnitus history should elicit detailed characteristics about the tinnitus including location, quality (eg, tonal, roaring, clicking, pulsatile), onset (gradual or sudden), duration, and laterality. Modifying factors such as jaw or neck movements that can modulate the intensity or pitch of the tinnitus are important for differentiating somatosensory tinnitus.[53,54] The history should also assess how bothersome the tinnitus is and its impact on quality-of-life domains such as sleep, work, concentration, mood, and social activities. Associated symptoms such as hearing loss, vertigo, imbalance, ear pain, ear drainage, and neurologic deficits should be assessed. Tinnitus risk factors should also be inquired about such as history of noise exposure, ototoxic medication use (eg, high-dose aspirin, aminoglycosides), or tobacco use. Identifying tinnitus comorbidities including previous or current psychiatric illness (depressive, anxiety, somatic symptom, post-traumatic stress, and other disorders) or psychological disturbance, and relevant medical conditions (eg, cognitive impairment, migraine, temporomandibular joint [TMJ] dysfunction) will inform needed next steps for diagnosis and management.[55,56] **Table 6** outlines key portions of a comprehensive tinnitus history.

Additional comprehensive care may be required for patients presenting with tinnitus and psychological distress, sleep disturbance, somatosensory qualities, neurological symptoms, and/or pulsatile tinnitus. Tinnitus associated with psychological symptoms and somatosensory qualities are addressed in KAS 3 and KAS 4, respectively. Large population-based studies demonstrate that people with tinnitus have a significantly higher prevalence of sleep impairment, including insomnia, short sleep duration, poor sleep quality, and sleep deprivation, compared to those without tinnitus.[57-59] The association is bidirectional (meaning, each one can affect or cause the other): sleep disturbance can exacerbate tinnitus distress, and tinnitus can worsen sleep quality, creating a vicious cycle.[49] These findings underscore the importance of screening for and addressing sleep disorders with appropriate referrals in the management of tinnitus.[58,60-62] References for clinical screening tools for sleep disorders and other key conditions commonly comorbid with tinnitus are presented in **Table 8**. Regarding neurologic disorders, neurodegenerative conditions such as Parkinson's disease and Alzheimer's disease are associated with tinnitus.[63] Systematic reviews, meta-analyses, and large cohort studies show an association between tinnitus and neurocognitive disorders, though causation and directionality have not been established.[64-68] Similarly, large-scale observational studies and systematic reviews have reported an association between migraine and tinnitus in adults (adjusted odds and hazard ratios ranging from 1.5 to 3.3).[69-73] As with other neurologic comorbidities, further research is needed to clarify mechanisms and causality. Key symptoms of other conditions associated with tinnitus are highlighted in **Tables 6** and **7**.

Pulsatile tinnitus should be excluded as it deserves special attention during the directed history and examination. It can be caused by various serious and nonserious medical conditions including intracranial hypertension, neoplasms, palatal myoclonus, middle ear pathology, semicircular canal dehiscence, venous anomalies, arteriovenous malformations, aberrant carotid

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Table 6. Key Details of the Medical History in the Patient With Tinnitus, Including Red Flags (in Bold)

Key issue	Significance	Implication
Unilateral tinnitus	Concern for focal auditory pathway lesions, some serious, such as vestibular schwannoma or vascular tumor	Referral for comprehensive audiologic assessment[a] and an otologic evaluation; additional testing such as imaging
Unilateral or asymmetric hearing loss	Possible presentation of serious lesion such as vestibular schwannoma or underlying otologic condition such as Ménière's disease	Audiologic and otologic assessment; imaging when indicated
Pulsatile tinnitus	Concern for vascular lesion, vascular tumor, systemic cardiovascular illness	Consider cardiovascular, neurologic, and general physical examination (increased intracranial hypertension, heart murmurs, carotid bruits, venous hums); examination of head and neck for vascular tumors or lesions; examination by audiology, ophthalmology and neuroimaging when indicated
Sudden onset of hearing loss with tinnitus	Sudden hearing loss requires prompt treatment to stabilize or improve hearing	See sudden SNHL guideline[46]
Vertigo or other balance dysfunction	Possible cochlear, retrocochlear, or central nervous system disorder (eg, Ménière's disease, superior canal dehiscence, vestibular schwannoma, posterior circulation stroke)	Audiologic, otologic, vestibular, neurologic assessment; imaging and referral when indicated
New neurological symptoms (new motor, sensory, visual, cognitive, speech or other neurological deficit)	Possible central neurological pathology such as demyelinating, vascular, or degenerative disease	Refer to neurology for evaluation; may need to be emergent for new, sudden-onset neurological symptoms
Symptoms of depression, anxiety, or mental health disorder	Tinnitus is often accompanied by mental health disorders. Severity impacts evaluation pace and treatment needs.	Screen for suicidal ideation; referral to mental health professionals for assessment and treatment; urgent referral for suicidal patients (KAS 3)
Hearing loss	Tinnitus is frequently associated with hearing loss, particularly SNHL; differentiate between conductive and SNHL, unilateral and bilateral; establish severity	Referral for comprehensive audiology; otologic evaluation for pathologies that could cause hearing loss associated with tinnitus; consider hearing aid evaluation when indicated
Positional or modifiable tinnitus	Concern for somatosensory tinnitus (KAS 4)	Referral to physical therapy or TMJ specialist for somatosensory tinnitus
Paroxysmal typewriter tinnitus (staccato, jackhammer) +/– vertigo	Possible neurovascular compression of the vestibulocochlear nerve	Audiologic, otologic, vestibular, neurologic assessment; imaging and referral when indicated[47]
Recent onset tinnitus	Tinnitus perception may diminish or disappear, and/or tinnitus reactions may be reduced over time	Evaluation and treatment are based on severity, and presence or absence of other symptoms
Otologic Conditions	Otitis media/effusion, ETD, obstruction of EAC, Ménière's Disease, etc. may cause tinnitus	Refer or treat for underlying otologic condition
Noise exposure	Tinnitus may be associated with prolonged noise exposure from occupational or recreational activities	Counseling and education on damaging effects of noise, acoustic trauma, and environmental exposures; referral for audiologic assessment
Smoking status	Smoking is associated with tinnitus	Counseling regarding cessation of smoking[48]
Medications and potential ototoxic exposures	Some medications (eg, salicylates) are associated with tinnitus; ototoxins can cause hearing loss and tinnitus. Interactions may exacerbate symptoms	Counseling regarding medication use; provide list of known ototoxic medications as part of counseling; comprehensive audiologic assessment[a]
Sleep Disorders	Insomnia, obstructive sleep apnea and other sleep disorders may modulate tinnitus; tinnitus may worsen sleep[49-52]	Screen for sleep disorders and make referrals to sleep specialists

(*continued*)

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Table 6. (continued)

Key issue	Significance	Implication
Migrainous features (photophobia, phonophobia, osmophobia, head pain, neck pain, worsening with physical activity)	Migraine is commonly comorbid with tinnitus and treatment of migraine may impact tinnitus	Screen and/or refer for migraine diagnosis and management
Head injury or whiplash	Associated with tinnitus development	Refer to primary care or neurology for further diagnosis and management
Apparent cognitive impairments	Patients at risk for tinnitus are also at risk for further cognitive decline from dementia and hearing loss; patients with cognitive impairment may not be able to fully characterize tinnitus	Presence of cognitive impairment affects results of tinnitus and audiologic assessments; tinnitus may impact cognition; refer to primary care or neurology

Abbreviations: EAC, external auditory canal; ETD, Eustachian tube dysfunction; SNHL, sensorineural hearing loss; TMJ, temporomandibular joint.
[a]A definition of *comprehensive audiologic assessment* can be found in **Table 14**.

arteries, and other vascular disorders that should not be missed. A comprehensive pulsatile tinnitus work-up is outside the scope of this guideline and has been previously published elsewhere.[9,70,83-85]

Tinnitus Physical Examination

The physical examination for tinnitus should focus on identifying serious, treatable, and/or explainable underlying causes of tinnitus (**Table 7**). Otoscopy should be performed to identify otologic causes such as cerumen impaction, middle ear effusion, or retrotympanic vascular lesions. A complete head and neck examination should be performed to identify treatable otologic conditions and signs of serious disease. TMJ, bruxism, malocclusion, cervicalgia, and other somatosensory causes of tinnitus should be assessed. A focused neurologic examination should exclude motor and/or sensory deficits as well as cranial nerve dysfunction that may accompany central nervous system lesions. A clinical vestibular examination is warranted for those presenting with dizziness or other vestibular symptoms in addition to tinnitus. The HINTS Plus[86] (Head Impulse, Nystagmus, Test of Skew, Plus hearing loss) examination for acute presentations.[86] Tuning fork testing can aid in detection of hearing loss but does not replace audiometry (KAS 5).

When pulsatile tinnitus is reported, the examination should focus on identification of cardiovascular disease, vascular lesions, intracranial hypertension, and third window phenomena of the inner ear such as superior semicircular canal dehiscence. A general cardiovascular examination, and auscultation of the skull, mastoid prominences, and neck should be part of this evaluation. Fundoscopy or referral for fundoscopic examination/imaging should be performed to evaluate for intracranial hypertension.

Statement 2: Bothersome Tinnitus

Clinicians should distinguish patients with bothersome tinnitus from patients with nonbothersome tinnitus.

Evidence Strength: *Strong recommendation* based on inclusion criteria for randomized controlled trials on tinnitus treatment, with a preponderance of benefit over harm.

Action Statement Profile: 2

- **Quality improvement opportunity:** To identify those patients in need of clinical management and limit unnecessary testing and treatment for others.
- **Aggregate evidence quality:** Grade B, based on inclusion criteria for RCTs on tinnitus treatment
- **Level of confidence in evidence:** High.
- **Benefits:** Identify patients for further counseling and/or intervention/management; determine impact of tinnitus on health-related QOL; identify patients with bothersome tinnitus who may benefit from additional assessment for symptoms of anxiety and depression; encourage an explicit and systematic assessment of patients to avoid underestimating or trivializing the impact of tinnitus; avoid unnecessary interventions/management of patients with non-bothersome tinnitus
- **Risks, harms, costs:** Time involved in assessment.
- **Benefit-harm assessment:** Preponderance of benefit.
- **Value judgments:** None.
- **Intentional vagueness:** Method of distinguishing bothersome vs nonbothersome is not specifically stated. One or more of the validated questionnaires and tinnitus assessment instruments described in the supporting text may be helpful.
- **Role of patient preferences:** None.
- **Exceptions:** None.
- **Policy level:** Strong recommendation.
- **Differences of opinion:** None.

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Table 7. Key Details of Physical Examination in the Tinnitus Patient (Red Flags in Bold)

Key Issue	Significance	Implication
Objective tinnitus	Rarely, tinnitus can be heard by the clinician as well as the patient.	Objective tinnitus may be caused by identifiable diseases, such as vascular abnormalities and myoclonus.
Heart murmurs, carotid bruits, or vascular sounds	Cardiovascular disease and vascular lesions may cause tinnitus.	Treatment of the underlying disease may improve tinnitus symptoms. Cardiovascular disease (eg, carotid stenosis, heart murmurs, hypertension) can have morbidities more substantial than tinnitus and requires appropriate evaluation and treatment.
Focal neurologic signs	Tinnitus patients should undergo neurologic assessment. Any focal neurologic deficits will dictate additional evaluation and treatment.	Referral to appropriate specialists (eg, neurologists, otologists/neurotologists, head and neck surgeons) for appropriate workup, which may include neuroimaging
Spontaneous Nystagmus	Labyrinthitis or posterior circulation stroke may present with new onset tinnitus	Emergently perform HINTS Plus examination or refer to clinician who can perform emergently
Otorrhea	Sign of middle ear infection or otitis externa	Treatment of otitis media/externa may improve tinnitus as well as associated hearing difficulties.
Signs of other external or middle ear disease on examination and/or otoscopy	Simple problems such as cerumen impaction or otitis media can be detected. Cholesteatoma, glomus tumors, and other uncommon middle ear disorders can be detected by otoscopy.	Appropriate referral can be made for diagnosis and treatment of external auditory canal issues such as cerumen, and middle ear disease such as otitis media or middle ear masses. Imaging can be performed when indicated.
Head and neck masses	A head and neck mass associated with ipsilateral tinnitus requires prompt investigation.	Referral to appropriate specialists; imaging when indicated
Temporomandibular joint dysfunction	Focal TMJ pain, altered range of motion, altered position, or TMJ movement modulating tinnitus may indicate somatosensory tinnitus.	Referral to appropriate specialists; imaging when indicated
Cervical spine signs	Paraspinal trigger points, altered range of motion, or cervical movement modulating tinnitus may indicate somatosensory tinnitus	Referral to appropriate specialists; imaging when indicated
Objective clicking or fluttering	Soft palate or tympanic membrane movement synchronous with tinnitus may indicate palatal or middle ear myoclonus, respectively	Referral to appropriate specialists; imaging when indicated

- **Changes from the 2014 Guidelines**: None.
- **Implementation considerations:** Uncertainty for which features of initial evaluations and which specific tinnitus assessment instruments will best identify patients with bothersome tinnitus.

Supporting Text

The purpose of this statement is to assist clinicians in distinguishing bothersome from nonbothersome tinnitus, enabling appropriate patient education, evaluation, management, and appropriate follow-up, as well as avoiding unnecessary intervention (**Table 9**).

Tinnitus has 2 components: sound perception and emotional reaction. Whereas a patient may complain of the perception (sound quality) of tinnitus, the clinician must also appreciate the significance of the patient's negative reaction (eg, symptoms of anxiety and depression) to tinnitus. Negative reactions such as anxiety and depression correlate with reductions in health-related quality of life,[87] impaired cognition, executive functioning,[56] and health care overutilization.[88]

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Table 8. Examples of Screening Questionnaires for Tinnitus Comorbidities

Comorbidity	Example tool	Notes
Depression	Patient Health Questionnaire (PHQ)-2 PHQ-9	PHQ-2 ≥ 3, then complete PHQ-9 PHQ-9 ≥ 10 or suicidal; refer for psychiatric evaluation[74]
Anxiety	Generalized Anxiety Disorder (GAD)-2 GAD-7	GAD-2 ≥ 3, then complete GAD-7 or interview GAD-7 ≥ 10; refer for psychiatric evaluation[75]
Insomnia	Insomnia Severity Index (ISI)	ISI > 101; should be referred for diagnostic sleep studies or specialist evaluation.[76]
Daytime sleepiness	Epworth Sleepiness Scale (ESS)	ESS ≥ 11 should be referred for diagnostic sleep studies or specialist evaluation.[77]
OSA	STOP-BANG	STOP- BANG ≥ 3 should be referred for diagnostic sleep studies or specialist evaluation.[78]
Somatosensory tinnitus	Temporomandibular disorder (TMD) Pain Screener Neck Disability Index (NDI)	TMD Pain Screener ≥ 3 on the 6-item version[79,80]
Migraine	ID-Migraine	ID-Migraine ≥ 2; refer for migraine management.[81]
Cognitive impairment	Mini-Mental State Exam (MMSE)	Optimize audibility and provide written prompts MMSE < 24; refer for formal cognitive evaluation (psychiatry or neurology).[82]

This illustrative list does not include every assessment instrument for tinnitus comorbidities. These questionnaires may be implemented and interpreted by clinicians of multiple disciplines engaged in the care of persons with tinnitus.
Abbreviations: ESS, Epworth Sleepiness Scale; GAD, Generalized Anxiety Disorder; ISI, Insomnia Severity Index; MMSE, Mini-Mental State Examination; NDI, Neck Disability Index; PHQ, Patient Health Questionnaire, STOP-BANG, Snoring, Tiredness, Observed apnea, high Blood pressure, BMI > 35 kg/m^2, Age >50 years, Neck circumference >40 cm, and Male gender; TMD, temporomandibular disorder.

Table 9. Definitions of Bothersome Versus Nonbothersome Tinnitus

Term	Definition
Bothersome tinnitus	Distressing to the patient; adversely affects quality of life and/or functional status
Nonbothersome tinnitus	Noticeable to the patient, but does not cause distress or impact quality of life

A clinician may distinguish bothersome from nonbothersome tinnitus by asking the patient:

1. If the tinnitus is bothersome, and if so, whether it is bothersome enough that the patient would like to pursue further intervention(s).
2. If the tinnitus interferes with communication, concentration, sleep, or enjoyment of life.
3. How much time and effort the patient has put into seeking treatments for the tinnitus.

Or:

4. Administering One of Several Validated Questionnaires/Surveys (**Table 10**)

There is significant variability in reporting measures of tinnitus severity,[98] and tinnitus is sometimes reported as either "severe" or "chronic."[3] Longitudinal data show tinnitus impact often decreases over time, and some patients require no active management.[16]

Distinguishing bothersome from nonbothersome tinnitus will ensure that those patients who are offered therapy are similar to those enrolled in clinical trials, making it possible to apply the recommendations from those trials. Within the category of patients with bothersome tinnitus is a subset of individuals who may be significantly depressed or even suicidal. These patients warrant emergent psychiatric evaluation and treatment (**KAS 3**). For patients with bothersome tinnitus, administration of one of several validated questionnaires will help characterize the type of tinnitus-related disability, as well as quantify the severity of such disability. Use of these instruments also allows clinicians to obtain a baseline assessment to assess the effect of interventions.

Questionnaires can provide an important tool for understanding the problems faced by the patient. A simple clinical approach is to ask patients to make a list of the problems they attribute to their tinnitus.[28] Many standardized tinnitus questionnaires have been developed to determine the level and types of handicaps faced by tinnitus patients, including the Tinnitus Handicap Inventory (THI).[92] Tinnitus Reaction Questionnaire (TRQ).[39] Tinnitus Handicap Questionnaire (THQ).[90] and Tinnitus Functional Index (TFI).[93] The TFI has become more widely used in recent years, as it was developed to be highly responsive to treatment-related changes, and has been translated into numerous languages. Newer instruments seek to distinguish hearing

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Table 10. Comparison of Self-Report Tinnitus Questionnaires

Questionnaire (Author, year)	Content	Interpretation	Intended focus
Tinnitus Questionnaire (TQ)[89]	52 items • sleep disturbance • emotional distress • auditory perceptual difficulties • inappropriate or lack of coping skills	3 level category scale • true • partly true • not true	Designed to quantify symptoms and psychological impact, responsive to treatment-related changes
Tinnitus Handicap Questionnaire (THQ)[90]	27 items • physical, emotional, social consequence (factor 1) • effects on hearing (factor 2)	0 (*strongly disagrees*) to 100 (*strongly agrees*)	Designed to track a range of handicaps experienced by people with tinnitus
Tinnitus Reaction Questionnaire[91]	26 items: distress consequences, including: • anger • confusion • annoyance • helplessness • activity avoidance • panic	5-point scale (0 = not at all; 4 = almost all of the time)	Designed to track psychological and emotional reactions to tinnitus
Tinnitus Handicap Inventory (THI)[92]	25 items • role limitations in mental/social/occupational/physical functioning • anger, frustration • irritability • depression • catastrophic subscale: desperation, loss of control, inability to cope and escape, fear of grave disease	3 level category scale • yes • sometimes • no	Designed to assess the severity and functional impact of tinnitus on daily life, including psychological aspects of tinnitus distress
Tinnitus Functional Index (TFI)[93]	30 items with 8 subscales (subscales not validated) • intrusive • feeling • thinking • hearing • relaxing • sleeping • managing • quality of life	11-point scale (0-10)	Designed to assess the severity and functional impact of tinnitus on daily life, and to be highly responsive to treatment-related changes
Tinnitus and Hearing Survey (THS)[94]	Contains 10 items in 3 sections • Tinnitus • Hearing • Sound tolerance The tinnitus section includes 4 items examining effects of tinnitus on sleep, concentration, relaxation, and ability to get one's mind off tinnitus	Sections A and B use 5-point Likert scale (0-4; 0 = no problem, 4 = big problem) and are summed separately Section C contains one scale (0-4 score) and one free text item	Designed to be a triage tool to separate tinnitus-specific problems from hearing problems and to screen for sound hypersensitivity disorders
Modified Tinnitus and Hearing Survey – Tinnitus Subscale (THS-T40)[95]	Same 4 tinnitus items as THS (above) expanded to 11-point numeric scale	Uses 10-point Likert scale (0-10; 0 = No, not a problem, 10 = Yes, a	Designed to track symptom severity

(*continued*)

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Table 10. (continued)

Questionnaire (Author, year)	Content	Interpretation	Intended focus
		very big problem), items summed for total score.	
Tinnitus Primary Function Questionnaire (TPFQ)[96]	Contains 20 items across 4 domains: • Hearing • Sleep • Concentration • Emotions Shorter, 12-item form also validated	Each item is rated 0 (completely disagree) to 100 (completely agree). The total score is calculated as the means of all items and reported from 0 to 100. Domain scores can also be reported 0 to 100 using means from items in that domain.	Designed to capture the effects of tinnitus on daily life, and be responsive to interventions
FiveQ[97]	Contains 5 items examining effects of tinnitus in the past week on • sleep • mood • concentration • hearing • activities of daily living	Each item is rated 1 (no impact) to 10 (intense impact). Total score is multiplied by 2 to obtain a score out of 100. Scaled "severity bands": (slight = 0-16; mild = 18-36; moderate = 38-56; severe = 58-76, catastrophic = 78-100)	Designed to be rapid, time-specific, and responsive to intervention

problems from those stemming from tinnitus, such as the Tinnitus and Hearing Survey (THS).[94] This was modified in 2024, to an 11-point scale (THS-T40) to better align with the TFI and become more sensitive for determining if a patient is or is not bothered by their tinnitus and to guide when audiology referral and intervention may be indicated.[95] The FiveQ is a 5-question survey to more rapidly assess tinnitus in the clinical setting.[97] Visual analog scales (VAS) for tinnitus typically employ a 0 to 10 numeric scale on which patients mark subjective perception of symptom severity across dimensions such as loudness.[99] These questionnaires have also been used in clinical trials to assess treatment effects.

Examples of instruments are summarized in **Table 10**. These tinnitus questionnaires have been used to document the problems and functional limitations associated with tinnitus, and measure changes throughout the course of treatment. These questionnaires differ primarily in the measurement scales used, as well as the primary functions and secondary activities assessed.[100,101] While the TFI and THI are currently the most widely used instruments in clinical trials and practice, there is no single standard instrument for assessing tinnitus severity or the efficacy of management. Regarding ease of use, shorter questionnaires may be more practical for clinical settings.

Each tinnitus questionnaire will have a minimal clinically important difference (MCID), which is the smallest score change that patients and clinicians perceive as clinically meaningful.[102,103] This metric is useful because it distinguishes clinically significant improvement from statistical variation. MCIDs can vary by clinical context and across studies.[102-105] Clinicians should use consistent tools over time to monitor progress and interpret individual scores cautiously.

Because tinnitus is often associated with complex psychological issues, most instruments include items that address the emotions and thoughts experienced by these patients and include questions about sleep. By administering these instruments at the initial evaluation to establish a baseline and using the same measures consistently throughout the course of care, clinicians may monitor progress, document treatment response, and compare outcomes across timepoints and treatment modalities.

Statement 3: Self-Harm

Clinicians should inquire about risks for self-harm in a patient with bothersome tinnitus.

Evidence Strength: *Strong Recommendation* based on systematic reviews of observational studies, case reports with a large preponderance of benefits over harm.

Action Statement Profile: 3

- **Quality improvement opportunity:** To identify tinnitus patients at risk of self-harm and/or suicide.
- **Aggregate evidence quality:** C.
- **Level of confidence in evidence:** High.
- **Benefits:** Prompt referral to appropriate resources for the small subset of tinnitus patients at risk for self-harm.
- **Risks, harms, costs:** Time and resources needed to inquire about self-harm; intrusive inquiry for those patients who are not at risk.

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- **Benefit-harm assessment:** preponderance of benefit over harm.
- **Value judgments:** GUG members perceive inconsistent or inadequate identification of tinnitus patients at risk for self-harm.
- **Intentional vagueness:** The methods for inquiry to identify risks of self-harm are not specified.
- **Role of patient preferences:** None.
- **Exceptions:** None.
- **Policy level:** Strong recommendation. While the usual process of evaluation of supporting evidence and benefits-harms would lead to a *recommendation*, the GUG felt the documented high risk for self-harm and severe consequence in tinnitus patients required a *strong recommendation*.
- **Differences of opinion:** None.
- **Changes from 2014 Guidelines:** This is a new key action statement.
- **Implementation considerations:** Uncertainty on the best ways to identify patients at risk for self-harm.

Supporting Text

The purpose of this statement is to emphasize the importance of screening all patients with bothersome tinnitus for the risk of self-harm in order to facilitate timely referral for mental health evaluation and intervention, thereby potentially preventing catastrophic outcomes. Patients with bothersome tinnitus may experience significant stress and emotional distress, which can include symptoms of depression, anxiety, and, in some cases, suicidal ideation, or behavior.[6,7,50,62,106] Recognition of this association is critical because tinnitus-related psychological distress can be severe and may lead to self-harm if unrecognized or untreated.

A recent meta-analysis found suicidal ideation in 19.5% and suicide attempts in 1.9% of patients with tinnitus.[7] Additional risk factors for suicide include anxiety disorders, depressive disorders, psychotic disorder, bipolar disorders, borderline personality disorder, substance use disorders, family history of suicide, and prior suicide attempts.[107] Many patients who die by suicide have recent contact with clinicians, though not necessarily for psychiatric complaints.[108,109] Routine mental health screening has become common in primary care and is increasingly incorporated into collaborative care models that integrate mental health services. These approaches emphasize measurement-based care, using validated, standardized instruments to detect psychological distress and suicidal ideation. Direct evaluation of suicide risk (irrespective of specific psychiatric illness) is indicated when patients present with suicidal ideation.

There is no single question validated for assessing the risk of self-harm in individuals with tinnitus. One approach that a clinician may use is asking Item 9 from the Patient Health Questionnaire-9 (PHQ-9).[110] (Available at https://www.nih.gov/node/19946). The PHQ-9 is a 9-item self-rating scale for major depressive disorder.[110] The patient is asked to report various symptoms over the previous 2 weeks, using the initial prompt, "Over the last 2 weeks, how often have you been bothered by the following problems?". Each of its 9 items is rated 0 to 3 for severity (0, not at all; 1, several days, 2, more than half the days, 3, nearly every day, total score range 0-27). Item 9 directly addresses suicidal thoughts ("Thoughts that you would be better off dead or hurting yourself in some way") and can be used as a brief screen for suicidality, independent of the total score.

A commonly used and accessible suicide risk assessment instrument is the Columbia Suicide Severity Rating Scale (C-SSRS).[111] The C-SSRS is a validated tool that stratifies suicide risk as low, moderate, or high. (Available at https://cssrs.columbia.edu/the-columbia-scale-c-ssrs/cssrs-for-communities-and-healthcare/#filter=healthcare.english).[111,112] It can be administered in outpatient settings and is widely used in emergency medicine and psychiatry. Patients identified as being at imminent risk should be directed to emergency psychiatric evaluation, for example, in an emergency department with psychiatric resources or at a psychiatric facility. Patients who endorse suicidal thoughts but are not at imminent risk should receive expedited referral to mental healthcare.[111] Those already engaged in psychiatric treatment should be encouraged to contact their psychiatrist or other mental health clinician promptly.

Direct communication between the clinician managing tinnitus and a mental health clinician may facilitate coordinated care and monitoring of changes in suicide risk but, if timely direct communication is not possible, the patient should be referred to emergency care. Appropriate pharmacologic, psychotherapeutic, or neuromodulation-based interventions typically reduce suicidal ideation, especially when associated with major depressive disorder. Improvement in depressive symptoms often parallels a reduction in tinnitus distress, particularly when tinnitus severity is closely linked to depressed mood and/or hopelessness.[113,114]

Statement 4: Somatosensory Tinnitus

Clinicians may inquire about somatosensory features in patients with persistent, bothersome tinnitus.

Evidence Strength: *Option* based on observational studies as well as systematic reviews and randomized controlled trials of treatment and a preponderance of benefits over harm.

Action Statement Profile: 4

- **Quality improvement opportunity:** To identify patients with somatosensory modifiers of bothersome tinnitus that could lead to appropriate referral and directed treatment plans.
- **Aggregate evidence quality:** Grade A, systematic reviews of randomized controlled trials of treatments

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of somatosensory conditions, Grade C, observational studies of the relationship of somatosensory features with tinnitus.

- **Level of confidence in evidence:** Medium about association of somatosensory features with tinnitus, low about the impact of interventions for these features in isolation.
- **Benefits:** Identify patients who have somatosensory components of tinnitus to allow better education, appropriate referrals for medical treatments and therapies.
- **Risks, harms, costs:** Time and expense of additional inquiry at initial evaluation of tinnitus patients.
- **Benefits-harms analysis:** Preponderance of benefits over harms.
- **Value judgments:** Somatosensory features are not often considered by clinicians and may be common.
- **Intentional vagueness:** The method of inquiry and the type of features are not specified.
- **Role of patient preferences:** None.
- **Exceptions:** None.
- **Policy level:** Option.
- **Differences of opinion:** Some GUG members desired an action statement about specific referrals and treatment strategies for somatosensory components of tinnitus. There was discussion about the strength of obligation, specifically *recommendation* versus *option*.
- **Changes from 2014 guidelines:** This is a new key action statement.
- **Implementation considerations**: Uncertainty about the best ways to identify somatosensory components of tinnitus.

Supporting Text

The purpose of this statement is to encourage clinicians to identify patients with somatosensory modifiers of bothersome tinnitus to direct appropriate referrals and treatment plans. Somatosensory tinnitus is a subtype of subjective tinnitus influenced by input from the musculoskeletal system, particularly the cervical spine, TMJ, and cranial musculature. An international consensus group developed diagnostic criteria through a Delphi process concluding that somatosensory tinnitus is suggested when tinnitus can be modulated by voluntary head, neck, jaw, or eye movements; by somatic maneuvers or pressure on myofascial trigger points; or when it coexists with musculoskeletal pain, temporomandibular dysfunction (TMD, or bruxism) (**Table 11**). Importantly, these criteria do not define a distinct disease entity but rather a recognizable clinical subtype of tinnitus. A brief set of screening questions derived from these diagnostic criteria is provided in **Table 12** to help clinicians identify somatosensory features during routine tinnitus evaluations.

The pathophysiology is thought to involve aberrant cross-modal plasticity between somatosensory and auditory pathways. Because somatosensory tinnitus is common, underrecognized, and potentially amenable to targeted interventions, the guideline update group judged that inquiry into somatosensory features represented a clinical opportunity. It remains unclear whether interventions afforded by such inquiry will have a clinically significant impact on tinnitus suffering.

Somatic modulation of tinnitus is reported in approximately 69% of patients across studies of unilateral or bilateral tinnitus.[115] Modulation is most often observed with jaw movements, neck flexion or extension, and facial

Table 11. Summary of PropoDiagnostic Criteria for Somatosensory Tinnitus

Domain	Criteria (if present, strongly suggest somatosensory influence of tinnitus)
Tinnitus Modulation	• Tinnitus can be modulated by voluntary movements of head, neck, jaw, or eyes • Tinnitus can be modulated by somatic maneuvers (eg, muscle contractions) • Tinnitus is modulated by pressure on myofascial trigger points
Tinnitus Characteristics	• Tinnitus and neck/jaw pain complaints appeared simultaneously • Tinnitus and neck/jaw pain symptoms aggravate simultaneously • Tinnitus preceded by head or neck trauma • Tinnitus increases with poor posture • Tinnitus pitch, loudness, and/or location vary • Unilateral tinnitus not explained by audiogram
Accompanying Symptoms	• Frequent pain in cervical spine, head, or shoulder girdle • Pressure-tender myofascial trigger points present • Increased muscle tension in suboccipital muscles • Increased muscle tension in cervical extensor muscles • Temporomandibular disorders present • Teeth clenching or bruxism • Coexisting dental disease

(Adapted from Michiels S, et al. Diagnostic Criteria for Somatosensory Tinnitus: A Delphi Process and Face-to-Face Meeting. Front Neurosci. 2018; 12:119).

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Table 12. Brief Screening Questions for Somatosensory Features of Tinnitus

Core domain	Screening question (yes/no)	What a "yes" suggests
Somatic modulation	"Does your tinnitus change when you move your jaw or neck (for example, clenching teeth, opening wide, or turning your head)?"	Strong indicator of somatosensory modulation.
Pressure/maneuver modulation	"Does pressing on sore spots in your jaw or neck muscles change the sound?"	Supports myofascial or cervical contribution.
TMD/neck symptoms	"Do you have jaw problems (TMJ pain/clicking/locking) or frequent neck/shoulder pain?"	Common coexisting musculoskeletal drivers.
Temporal association	"Did your tinnitus start around the same time as jaw or neck pain, or after head/neck injury?"	Temporal linkage consistent with somatosensory origin.

muscle activation. One review found modulation in 30% of patients with TMJ maneuvers and in 24% with head/neck maneuvers, while ocular (6%) or extremity (9%) modulation was less common.[115]

Tinnitus occurs in 30%-64% of patients with TMD.[116,117] Patients with tinnitus with TMD tend to be female and have better hearing compared with the broader tinnitus population.[118] These observations highlight the need for targeted history-taking to identify somatosensory influences.

Patients with underlying biomechanical deficits such as cervical spine dysfunction or TMD may benefit from physical therapy and related interventions. Cervical dysfunction refers to impaired mobility, abnormal posture, or muscular imbalance of the cervical spine that can generate or exacerbate somatic input to auditory pathways. Common findings include restricted cervical range of motion, tenderness of paraspinal or suboccipital muscles, and pain provoked by neck movement or palpation. A systematic review and meta-analysis of 4 RCTs demonstrated consistent reductions in tinnitus severity, THI scores, and TMD pain following physical therapy in patients with TMD-related tinnitus, along with additional improvement in TMD pain and jaw function.[119] Interventions included bite splints, jaw exercises, occlusal adjustment, and counseling. Eight RCTs have evaluated therapies such as manual therapy, jaw exercises, cervical interventions, and multimodal physiotherapy in patients with somatically modulated tinnitus. The 8 randomized controlled trials (RCTs) evaluating physical therapy for somatosensory tinnitus are summarized in **Table 13**. These studies consistently demonstrated improved tinnitus outcomes sustained up to 3 to 6 months (**Table 11**). Predictors of benefit in these studies include higher baseline somatic scores,[120] concurrent TMD or cervical complaints,[8] and presence of musculoskeletal strain.[121]

The benefits of routinely asking about somatic modulation are threefold: (1) identifying a clinically meaningful tinnitus subtype; (2) facilitating targeted referral (eg, dentistry, physical therapy, or musculoskeletal specialists); and (3) enhancing patient education about symptom modulation and coping strategies. Potential harm includes the additional time during evaluation and potential referral-related costs. The balance of evidence favors benefit over harm.

Clinicians should ask whether tinnitus changes with head, neck, or jaw movement. If modulation is present, referral to a dental, musculoskeletal, or physical therapy specialist may be warranted, especially in patients with concurrent TMD or cervical dysfunction.

Patients should be counseled that while identifying somatic modulation can guide management, no single therapeutic approach is universally recommended. Recognition and documentation of somatosensory features are first steps toward individualized care.

Statement 5: Audiological Evaluation

Clinicians should obtain a comprehensive audiological evaluation in patients with tinnitus.

Evidence Strength: *Recommendation* based on observational studies, with a preponderance of benefit over risk.

Action Statement Profile: 5

- **Quality improvement opportunity:** To address potential underutilization of audiologic testing in patients with tinnitus who are likely to have underlying hearing loss and to avoid delay in such diagnosis.
- **Aggregate evidence quality**: Grade C, based on observational studies.
- **Level of confidence in the evidence:** High, as literature shows, hearing loss is commonly found in tinnitus patients.
- **Benefits:** Prioritize the need for otolaryngologic evaluation (if not already completed) using audiologic criteria; identify hearing loss, which is frequently associated with tinnitus and can be treated with hearing aids and cochlear implants; characterize the nature of hearing loss (conductive, sensorineural, or mixed; unilateral or bilateral); detect hearing loss that may be unsuspected; initiate workup for serious disease that causes unilateral tinnitus and hearing loss (ie, Vestibular Schwannoma).

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Table 13. Summary of Eight RCTs Evaluating Physical Therapy for Somatosensory Tinnitus

Study	N	Intervention	Primary outcome	Follow-up
Hong 2023[122]	64	Cervical/stretch/exercise PT	THI ↓ from 42.8 to 29.1; VAS ↓ from 38.9 to 25.7 ($P < .001$)	Sustained through 12 weeks
van der Wal 2020[123]	80	Orofacial PT (massage, splint, stretch)	TFI ↓ 13.8 vs ↓ 5.0 ($P = .006$); 34%-61% improved	Effects maintained
Michiels 2016[124]	38	Multimodal cervical PT	TFI improved ($P = .04$); 53% improved posttreatment	24% maintained at follow-up
Delgado de la Serna 2019[125]	61	PT + manual therapy vs PT alone	THI and TMD pain ↓ ($P < .001$)	Maintained at 3 and 6 months
Atan 2020[126]	30	Kinesio taping vs sham	THI and VAS ↓ ($P < .001$)	Not reported
Amanda 2010[104]	80	IntraX transcutaneous dynamic electrical stimulation + osteopathic therapy	Self-reported improvement in loudness/awareness	Not reported
Côté 2019[127]	31	Multimodal PT (manual/postural/exercise)	THI ↓ 15, VAS ↓ 13-15 ($P < .001$); 14/31 improved at 3 months	Reported at 3 months
Yu 2024[120]	43	Cervical strength/stretch/joint PT	THI improved by +11.1, VAS improved by +1.25 vs delayed group ($P < .05$)	35% maintained at 12 weeks

- **Risks, harms, costs:** Direct cost of examination; access to testing; time involved in testing.
- **Benefit-harm assessment:** Preponderance of benefit over harm.
- **Value judgments:** None.
- **Intentional vagueness:** The GUG acknowledged that the composition and timing of testing may vary.
- **Role of Patient Preferences:** None.
- **Exceptions:** None.
- **Policy level:** Recommendation.
- **Differences of opinion:** None.
- **Changes from 2014 Guidelines**: The 2014 guideline recommended prompt audiologic assessment in tinnitus patients who had unilateral symptoms, hearing difficulties, or tinnitus for >6 months. There was a second statement that gave the option for audiologic testing for any patient with tinnitus. The GUG felt this distinction was unnecessary and emphasized the importance of audiologic assessment for tinnitus patients.
- **Implementation considerations:** Patient may not have access to audiological services within the 4- to 6-week time frame recommended.

Supporting Text

The purpose of this recommendation is to advise clinicians that audiologic evaluation is warranted for any patient with tinnitus. Although evidence on the ideal timing is scant and publication quality is modest, based on observational cohort studies, case series, and systematic reviews and meta-analyses of these studies, the GUG recommends completion of an audiologic evaluation for all people reporting tinnitus, even if the tinnitus is of recent onset, bilateral, or not accompanied by subjective hearing difficulties. Ideally, the audiologic evaluation is completed within 4 to 6 weeks of the initial presentation, except in rare cases where more urgent evaluation is warranted (eg, suspected sudden sensorineural hearing loss).[46] Completion of an audiologic evaluation within 4 to 6 weeks of initial presentation may not be feasible in some settings.

The audiologic evaluation should define the degree and nature of any hearing loss and assess the potential need for audiologic management of hearing loss and/or tinnitus. In addition to identifying hearing loss, audiologic evaluations also identify audiometric results and configurations that may be a sign of a more serious underlying problem that warrants medical intervention. For example, unilateral hearing loss or asymmetric hearing loss may be a sign of VS, vascular lesion, or other retrocochlear pathology. Audiologists are trained to identify indicators warranting referrals to otolaryngology and are expected to make such referrals when appropriate based on the results of the audiologic evaluation. Even though some medical conditions that cause tinnitus are serious, most are indolent, slow-growing, or chronic

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lesions that would be identified in a reasonable timeline if discovered at an audiologic evaluation scheduled 4 to 6 weeks after a patient's initial presentation. Sudden SNHL may occur along with a sudden onset of tinnitus in the same ear. Some patients describe sudden SNHL as feeling like (or believing that) they have water stuck in one of their ear canals. Any report of a sudden onset of hearing loss, with or without sudden onset of tinnitus, warrants audiologic testing on the same day it is reported by the patient when possible, and no later than 14 days after symptom onset.[46]

Tinnitus is usually associated with some degree of hearing loss.[13,27,128-130] Although the majority of patients who complain of tinnitus also report hearing difficulties,[131] some patients attribute the consequences of unidentified hearing loss to their tinnitus. Identifying hearing loss promptly and providing hearing aids when appropriate has potential to benefit tinnitus patients by reducing stress and frustration around communication difficulties caused by untreated and/or unrecognized hearing loss, by increasing the patient's capacity to engage in meaningful relationships and activities that require spoken communication, and by reducing the impact of tinnitus by serving as a source of sound enrichment that goes wherever the patient goes without interfering with communication. The recommended minimum audiologic evaluation for a patient with tinnitus is a standard comprehensive audiologic evaluation including all components shown in **Table 14**. A comprehensive audiologic evaluation should adhere to the *Preferred Practice Patterns* [132] standards established by the American Speech-Language-Hearing Association, also detailed in **Table 14**.

A standard audiologic evaluation is routine practice for audiologists, but some procedures warrant special considerations when patients present with tinnitus.[134] For example, otoscopy is performed routinely prior to placing earphones for audiometric testing. Even a small amount of cerumen on the tympanic membrane can create a mass effect resulting in high frequency conductive hearing loss and tinnitus.[135] It is therefore important to consider this possibility when performing otoscopy. It is acceptable to use pulsed, warbled, or continuous tones for threshold testing, although the use of pulsed tones may assist some patients in distinguishing between the tones and the tinnitus, especially when the tinnitus pitch is close to the test frequency.[40,136-138]

Some patients with tinnitus have trouble tolerating louder sounds, and some report that certain sounds make their tinnitus louder. Audiologists should consider following these recommendations when conducting supra-threshold audiologic testing on tinnitus patients to improve patient comfort:

Table 14. Components of Comprehensive Audiologic Examination

Key component	Pertinent details
Thorough case history	See Key Action Statement 1
Otoscopy with removal of excessive or obstructive cerumen	See cerumen management guideline[133]
Current American National Standards Institute (ANSI) standards should be met regarding maximum allowable ambient noise levels in the test environment; calibration of the audiometer; audiogram documentation, including use of the proper aspect ratio; and symbols.	Ear-specific masked air and bone conduction thresholds, speech recognition threshold (SRT), and word recognition scores (WRS) should be obtained. Reliability and validity of test results should be documented. Air conduction (AC) thresholds should be measured at 250 to 8000 Hz. Additional mid-octave frequencies that may be helpful include 750, 1500, 3000, and 6000 Hz and should be measured if differences in thresholds at 500 and 1000 or 1000 and 2000 Hz are ≥20 dB hearing level (HL). Bone conduction (BC) thresholds should be measured at 250 to 4000 Hz.
Ear-specific SRT in dB HL should be measured using standardized spondee word lists (eg, CID W-1), preferably recorded, but monitored-live voice (MLV) is acceptable.	Agreement between pure tone average (PTA) and SRT is helpful in assessing accuracy of hearing assessment and reliability of responses.
Ear-specific WRS (in %) should be measured at a supra-threshold presentation level using recorded word lists	The clinician managing the patient with tinnitus will of necessity rely on the results of serial audiometric evaluations. As such, there is a need for proper audiologic documentation, not only of AC and BC thresholds as well as SRT and WRS, but also of masking levels, reliability, validity, word lists used, method of presentation (MLV or recorded), and type of transducer, in order for ongoing comparisons to be useful.
Ear-specific immittance measurements may be completed on each ear using equipment calibrated to current ANSI standards.	Immittance measures may include ear-specific tympanograms, ear-specific contralateral acoustic reflex thresholds (dB HL) at 500 to 4000 Hz, ear-specific ipsilateral acoustic reflex thresholds (dB HL) at 500 to 4000 Hz, and/or ear-specific acoustic reflex decay (dB HL) at 500 and 1000 Hz.

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- Use the softest effective masking sounds during traditional audiometry.
- Use comfortable levels of sound during word recognition testing.
- Approach reflex threshold and decay testing with particular caution. In some individual cases an audiologist may decide that the risk of discomfort from testing outweighs the benefit of obtaining test results.
- Consider limiting pure tone presentation level to 105 dB HL or lower.
- Consider limiting speech stimuli to 100 dB HL or lower.

Additional testing that may be considered includes administration of one or more questionnaires to assess the functional impact of tinnitus (see KAS 2),[139] extended high-frequency testing, and speech in noise testing. Extended high-frequency audiometry may facilitate early identification of hearing loss in adults and foster discussions about hearing loss prevention.[57,140] Testing speech understanding in competing noise can reveal greater deficits in patients with tinnitus relative to people without tinnitus.[141]

Psychoacoustic testing of tinnitus (ie, tinnitus loudness and pitch matching, minimum masking levels, and residual inhibition testing) is not routinely recommended, as these results are not helpful for diagnostic purposes or assessing outcomes of intervention.[142] Manufacturers of proprietary tinnitus devices sometimes require pitch matching to fit their devices. In cases where the intervention for tinnitus is to teach coping strategies to improve quality of life with tinnitus, conducting tinnitus psychoacoustic testing may inadvertently encourage patients to continue to attend to what their tinnitus sounds like rather than focusing on the impact of using coping strategies on their life.

Statement 6: Imaging Studies

Clinicians should not obtain neuroradiologic imaging in patients with tinnitus specifically to evaluate the tinnitus unless they have one or more of the following: tinnitus that localizes to one ear, pulsatile tinnitus, focal neurological abnormalities, or asymmetric hearing loss.

Evidence Strength: *Strong recommendation against* based on observational studies, with a preponderance of benefit over harm.

Action Statement Profile: 6

- **Quality improvement opportunity:** To avoid overuse of imaging in patients with a low likelihood of any significant benefit from the imaging.
- **Aggregate evidence quality:** Grade C, based on observational studies.
- **Level of confidence in the evidence:** High.
- **Benefits:** Avoid testing with low yield; avoid harms of unnecessary tests (radiation, contrast, cost); avoid test anxiety; avoid detecting subclinical, incidental findings.
- **Risks, harms, costs:** Slight chance of missed diagnosis; relatively high costs and limited access to certain types of imaging studies.
- **Benefit-harm assessment:** Preponderance of benefit over harm.
- **Value judgments:** The GUG made this a *strong recommendation against*, instead of a *recommendation against*, based on consensus regarding the importance of avoiding low-yield, expensive tests with potential adverse events in patients with tinnitus.
- **Intentional vagueness**: Specific imaging studies are specified in the supporting text, including computed tomography (CT), computed tomography angiography (CTA), magnetic resonance imaging (MRI), and magnetic resonance angiography (MRA).
- **Role of patient preferences:** None.
- **Exceptions:** None.
- **Policy level:** Strong recommendation against.
- **Differences of opinion**: Some members of the GUG preferred a KAS that would prescribe specific indications for the use of neuroradiologic imaging in tinnitus patients, rather than recommend against routine use of imaging.
- **Changes from the 2014 Guidelines:** None.
- **Implementation considerations:** None.

Supporting Text

The purpose of this statement is to avoid inappropriate use of imaging studies in the evaluation of patients presenting with tinnitus. It is important to assess the specific presenting features of tinnitus in each patient, along with pertinent history and other associated signs and symptoms (see KAS 1), in order to determine whether imaging may be indicated.

Common choices of imaging studies for patients with tinnitus include computed tomography (CT) of the temporal bones, computed tomographic angiography (CTA) of the head and neck, computed tomographic venography (CTV) of the head, magnetic resonance imaging (MRI) of the internal auditory canals or brain, magnetic resonance angiography (MRA) of the head, and magnetic resonance venography (MRV) of the head. Conventional cervicocerebral angiography is invasive and reserved for specific diagnostic/therapeutic indications.[143-145]

CT entails the use of ionizing radiation, an important consideration particularly in the pediatric and pregnant populations.[146-148] MRI entails being within a strong magnetic field environment, which may be incompatible with patients with certain types of metallic implants, devices, prostheses, and wires. MR studies are also lengthy (30 minutes to an hour depending on specific protocols), which may be challenging for certain patients to undergo without sedation or anesthesia support

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(eg, young children, those with respiratory difficulties, those with claustrophobia). The MRI machine generates loud sounds, related to magnetic field gradient switches during various pulse sequences, which may be especially pertinent and bothersome to a patient who already has tinnitus.[149-152] Iodinated (CT) or gadolinium-based (MRI) contrast may be used in some imaging protocols. Potential harms include allergic reactions[149] and contrast-associated acute kidney injury with iodinated contrast,[150,153] and rarely nephrogenic systemic fibrosis with gadolinium-based agents in patients with severe renal dysfunction.[151,153] Gadolinium retention can occur in tissues, including the brain.[151] As well, imaging examinations are costly, may lead to false positive results, and the detection of incidental findings can lead to patient anxiety, added clinic visits and hospital stays, and healthcare economic and resource utilization such as diagnostic and therapeutic interventions of variable benefit.[152] It is therefore important to weigh the risk-benefit ratio of imaging evaluation for each patient, taking into account their individual tinnitus profile.

The clinician should assess the likelihood that the patient's tinnitus is related to an underlying anatomic abnormality that may be detectable on imaging, and, if so, which imaging modality and which anatomic part to image. An important starting point is to determine whether the patient's tinnitus is pulsatile or nonpulsatile, given the largely non-overlapping differential diagnostic entities in each category. The American College of Radiology Appropriateness Criteria® 2023 update on the topic of tinnitus stated that imaging for tinnitus is only indicated if there is pulsatile tinnitus, or non-pulsatile tinnitus if it is unilateral (**Table 15**).[144] In the setting of bilateral, non-pulsatile tinnitus without hearing loss, or neurological deficit, or a history of trauma, imaging is not recommended. This may include tinnitus related to metabolic disturbances, acoustic trauma, and ototoxic medication.[154] In these situations, imaging would not be recommended. Bilateral nonpulsatile tinnitus is often associated with sensorineural hearing loss, but yield from imaging studies in this case is low.[58,155,156] Javed et al found that, in patients presenting with unilateral tinnitus without asymmetrical hearing loss, MRI of the internal auditory canal has a low diagnostic yield for VS detection; those detected were mostly small tumors that were conservatively managed.[157]

Statement 7: Education and Counseling

Clinicians should educate patients with tinnitus about the natural history and effects of, and management strategies for tinnitus.

Evidence Strength: *Recommendation* based on studies of the value of education and counseling, with a preponderance of benefit over harm.

Action Statement Profile: 7

- **Quality improvement opportunity:** To address potential underutilization of education and counseling by clinicians who manage patients with persistent, bothersome tinnitus and to bring awareness of available management strategies to the patient.

Table 15. American College of Radiology Appropriateness Criteria® Tinnitus: 2023 Update. Summary[144] (Adapted)

Clinical scenario	Imaging studies recommended for *initial imaging*
Unilateral or bilateral pulsatile tinnitus with no retrotympanic lesion on otoscopy	Usually appropriate: • CTA of the head and neck with IV contrast • CTA of the head with IV contrast • Combination of MRI head and internal auditory canal without and with IV contrast, MRA head with IV contrast, and/or MRV head with IV contrast
Unilateral or bilateral pulsatile tinnitus with a suspected retrotympanic lesion on otoscopy	Usually appropriate: • CT temporal bone without IV contrast May be appropriate: • CTA head with IV contrast • CTV head with IV contrast • CTA head and neck with IV contrast
Unilateral nonpulsatile tinnitus without hearing loss, or neurological deficit, or history of trauma	Usually appropriate: • MRI head and internal auditory canal without and with IV contrast May be appropriate: • MRI head and internal auditory canal without IV contrast
Bilateral non-pulsatile tinnitus without hearing loss, or neurological deficit, or history of trauma	Imaging not recommended

Abbreviations: CT, computed tomography; CTA, computed tomography angiography; CTV, computed tomography venography; IV, intravenous; MRA, magnetic resonance angiography; MRI, magnetic resonance imaging.

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- **Aggregate evidence quality:** Grade B, based on studies of the value of education and counseling in general, and Grade C based on such studies in tinnitus in particular.
- **Level of confidence in the evidence:** High.
- **Benefits:** Improved QOL; increased ability to cope with tinnitus; improved outcomes and patient satisfaction; less healthcare utilization.
- **Risks, harms, costs:** Direct cost and time.
- **Benefit-harm assessment:** Preponderance of benefit over harm.
- **Value judgments:** None.
- **Intentional vagueness:** None.
- **Role of patient preferences:** None.
- **Exceptions:** None.
- **Policy level:** Recommendation.
- **Differences of opinion:** None.
- **Changes from the 2014 Guidelines**: The GUG emphasized that this education and counseling should include discussion of the natural history, effects of tinnitus, and co-morbid conditions in addition to the discussion about management strategies suggested in 2014.
- **Implementation considerations:** None.

Supporting Text

The purpose of this statement is to ensure that clinicians and patients understand that evidence-based management strategies for persistent, bothersome tinnitus do exist. Patient education is essential because it provides the foundation for shared decision-making, enhances adherence to management plans, and counters misinformation. Without this information, many patients are left with the impression that "nothing can be done," leading to frustration and pursuit of unproven or harmful treatment.[158]

Rationale for Education and Counseling

Education improves quality of life, coping, and patient satisfaction while reducing unnecessary healthcare utilization. Multiple guidelines emphasize that education and counseling for tinnitus should be interactive, equipping patients and caregivers with an understanding of prognosis, comorbid conditions, and evidence-based options.[4,159] Patients who participate in shared decision making are more likely to engage in recommended treatments and report improved outcomes.

Based on an awareness of the natural history, the prognosis, and management options, clinicians should engage the patient or the patient's proxy in decision making about the most appropriate strategy to consider. Although many people seek help for their tinnitus, they are often told that little or nothing can be done to help them. Most patients, and many clinicians, do not know the options available or appreciate the impact of these options for management of tinnitus. They face tempting advertisements and claims of treatments and cures. Some patients feeling desperate, and some not well-informed, may seek any kind of treatment offer that has the appearance of legitimacy. Despite a lack of cure for subjective tinnitus, there are many approaches to treatment that can improve symptoms and relieve distress.

Natural History and Prognosis

It is important for patients to learn about the natural history of tinnitus. Acute tinnitus (<6 months) often improves or stabilizes spontaneously, while persistent tinnitus (≥6 months) may remain chronic but is generally manageable with evidence-based care.[160] Education should emphasize that tinnitus is a symptom, not a disease, and that while like many other chronic conditions, there is no definitive cure, there are scientifically validated treatments available today that can make a meaningful difference. The patient should be informed that there are proven options to help them feel better, reduce distress, and improve their QOL. Patients should be encouraged to return for follow-up and re-assessment if their tinnitus persists and remains bothersome or if it worsens over time.

Effects and Comorbid Conditions

Clinicians should explain that tinnitus may affect concentration, sleep, hearing, mood, and social participation. High rates of comorbid anxiety and depression warrant routine screening and referral when appropriate.[160,161] Tinnitus is also strongly associated with hearing loss, and management should address both conditions.[162] Somatic contributors, such as TMJ disorders and cervical spine dysfunction, may also play a role and should be discussed.[163,164] Additional information about comorbid conditions is provided in KAS 1 through 4.

Patient counseling should include information on the association between tinnitus and hearing loss and should also discuss lifestyle factors that can have positive (eg, regular physical activity, restorative sleep, balanced diet) and negative (eg, stress, smoking, sleep disturbance) effects on tinnitus management.[48,165-169] Counseling should include information on hearing protection from noise, noting the association between noise-induced hearing loss and tinnitus.

Communication Style

Clinicians should avoid negative or alarmist statements such as "you just have to live with it" or "it may be caused by a brain tumor." Instead, counseling should emphasize that tinnitus itself is not dangerous, that co-existing medical conditions can be excluded with appropriate assessment, and that effective, evidence-based strategies are available to reduce its impact.[4,170]

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Management Options and Self-Help

Patients should be informed that effective management strategies include hearing protection from noise, educational counseling (information and self-management guidance), sound enrichment, and multidisciplinary care.[4,159] Educational counseling is intended to improve understanding of tinnitus and support coping and self-management.

Evidence also supports CBT-based interventions as a treatment approach for bothersome tinnitus (eg, in-person CBT, internet-based CBT, books, and interactive online programs). Meta-analyses show that iCBT produces moderate improvements in tinnitus distress, depression, and insomnia, with benefits sustained for up to 1 year.[171]

Patients should be encouraged to continue to seek treatment when needed, which may involve multidisciplinary care.[172] Patients can benefit from counseling and sound enrichment and the evidence for these strategies is presented in KAS 10 and KAS 11. Self-help brochures and books also provide benefits. One meta-analysis found that across 9 trials, there was no difference in outcomes between those receiving educational counseling alone as compared with those receiving other psychological or combination therapy.[173]

Patient education discussion points are presented in **Table 16**. The clinician should inform and educate tinnitus patients by:

- Providing brochures and links to reputable information repositories.
- Suggesting self-help books from reputable sources.
- Describing counseling and sound enrichment options.
- Discussing the availability, but also the lack of proven benefits and of potential harms, of pharmacologic and other medical therapies, as well as other options such as complementary and alternative medicine (CAM).
- Referring to other professionals.
- Discussing the benefits and data supporting a multidisciplinary approach to tinnitus treatment and care.
- Referring to support organizations and member health professionals (**Table 17**).

Brochures

Many brochures and patient education resources are available from professional organizations with some published and accessible online (eg, https://www.ata.org/about-tinnitus/patient-tools/; https://www.enthealth.org/; https://www.healthquality.va.gov/guidelines/CD/tinnitus/CST-02-PTM-WorkBook-11172024-Final-Draft-508-Compliant.pdf; https://www.asha.org/public/).

Self-Help Books

Self-help books and structured educational materials remain a useful adjunct for patients seeking independent ways to manage tinnitus. Early resources emphasized cognitive behavior modification and coping strategies.[174,175] More recent publications incorporate CBT, mindfulness, and acceptance-based approaches, reflecting advances in evidence-based care. Controlled studies and meta-analyses confirm that structured self-help can reduce tinnitus distress, with outcomes comparable to group-based interventions. In particular, self-help CBT interventions have demonstrated moderate effect sizes ($d \approx 0.3$-0.6) compared with passive controls, with benefits sustained at 1-year follow-up.[171]

Examples of books include (this is not an exhaustive list, and inclusion does not indicate endorsement of their contents):

- Henry, J.A., et al, *How to manage your tinnitus: A step-by-step workbook*. 3rd ed. 2010, San Diego: Plural.[176]
- Henry, J.A., *The progressive tinnitus management book: Step-by-step through the five levels of PTM*. 2025: Ears Gone Wrong, LLC.[177]
- Henry, J.A. The tinnitus book: Understanding Tinnitus and how to find relief.[178]
- McKenna, D., Handscomb, L., Hoare, D.J., & Hall, D. Living with Tinnitus and Hyperacusis (2nd ed., 2014). Blends CBT and mindfulness, accessible for patients and families.[179]
- Beukes, E.W. & Manchaiah, V. Internet-Based Cognitive Behavioral Therapy for Tinnitus (2019). A manual for patients exploring online self-help programs.[171]
- Tyler, R.S. (Ed.) The Consumer Handbook on Tinnitus (Revised ed., 2016). Covers diverse patient experiences, management strategies, and comorbidities.[180]

These resources provide practical exercises, coping strategies, and education on the relationship between tinnitus and associated conditions such as sleep disturbance, stress, and mental health. Patients should be guided toward reputable sources to avoid misinformation and unsupported "cure" claims.[158]

Self-Management Education

The clinician should emphasize to patients that, like many chronic conditions, tinnitus does not have a single "one-size-fits-all cure," but that many patients achieve meaningful improvements in quality of life with appropriate support and symptom-management strategies. This section focuses on educational counseling and sound enrichment as self-management approaches. Evidence-based therapeutic counseling interventions (eg, structured behavioral therapies such as CBT and related psychotherapeutic approaches) are addressed in KAS 11, and sound enrichment/device considerations are addressed in KAS 10.[181]

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Table 16. Patient Education Discussion Points for Bothersome Tinnitus

1. Definition of tinnitus	Tinnitus is sound that is created in the ears or in the head. It is a symptom and not a disease. People with chronic tinnitus usually hear it all or most of the time. For some people, tinnitus is intermittent.
2. Distinguishing tinnitus from transient ear noise (brief spontaneous tinnitus)	Transient ear noise is a sudden tonal, whistling, or ringing sound accompanied by the perception of hearing loss. The event is unilateral and seems to occur completely at random without anything precipitating the sudden onset of symptoms. Often, the ear feels blocked during the episode. The symptoms generally dissipate within a period of less than 5 minutes. Transient ear noise, sometimes also called brief spontaneous tinnitus, is normal.
3. Assessment of tinnitus and associated hearing loss	Patients with tinnitus commonly attribute hearing problems to tinnitus. The clinician should determine how much of a patient's complaint is due to a hearing problem and how much is due specifically to the tinnitus. Such assessment may require an audiologic examination and appropriate questionnaires.
4. Tinnitus can be temporary	Exposure to loud noise can cause temporary hearing threshold shifts as well as temporary tinnitus. Tinnitus induced in this fashion will likely resolve within a few days following the insult. Repeated episodes of noise exposure increase the likelihood that the tinnitus will become permanent.
5. Drugs and tinnitus	Tinnitus can be induced by a number of medications and drug interactions. Such tinnitus is usually temporary (typically lasting 1 to 2 weeks postexposure) but can be permanent—especially with the use of aminoglycoside antibiotics or the cancer chemotherapeutic drug cisplatin. Aspirin is well known to cause temporary tinnitus, although the dosage generally has to be rather high to induce tinnitus. Other medications that can cause temporary tinnitus include nonsteroidal anti-inflammatory drugs, loop diuretics, and quinine. Drugs used to treat psychiatric and sleep conditions also may trigger or exacerbate tinnitus.
6. Tinnitus can be managed	A cure for tinnitus does not yet exist, and despite claims to the contrary, no method has been proven to provide long-term suppression of tinnitus. We can help patients by relieving the functional effects of tinnitus, such as sleep disturbance, difficulty concentrating, problems with hearing, and difficulty relaxing. Patients need to be informed that although tinnitus cannot be cured, they can learn to manage their reactions to it, thereby improving their QOL. Healthcare professionals should be compassionate regarding patients' concerns and fears about tinnitus. A brief overview of the evidence-based interventions discussed later in this guideline can be presented.
7. Current theory on the pathophysiology of tinnitus	Research suggests that tinnitus results from the compensatory adaptation of the central auditory system to hearing loss. Clinical observations establish the near universal association of tinnitus with hearing loss. Hearing loss associated with tinnitus can range in severity from minimal to profound. Changes in inhibitory and excitatory neurotransmitters occur throughout the auditory pathway in association with tinnitus.
8. Need for multidisciplinary care.	Tinnitus is a heterogeneous condition and is the domain of various clinicians. A multi-disciplinary approach to the treatment of tinnitus may be required. There is no "one-size-fits-all" standard approach to care.

Educational counseling includes providing clear information about tinnitus, reassurance regarding typical clinical course, expectation-setting, discussion of factors that can worsen symptoms (eg, stress, sleep disruption, noise exposure), and guidance on practical coping strategies. Sound enrichment may be achieved using nonwearable or wearable sources (eg, broadband noise, nature sounds, background music), with adjustments to sound type and level to optimize comfort. Many everyday audio devices (eg, smartphones, radios, music players) can be used to trial sound enrichment and help patients determine whether it reduces tinnitus awareness or improves relaxation/sleep before considering purchase of dedicated devices (see KAS 10).

Referrals to Other Professionals

Patients with persistent, bothersome tinnitus can be referred to other healthcare professionals, particularly those who offer

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Table 17. Professional Organizations and Patient Support Groups for Tinnitus

Organization	Contact information (Website)	Description	Publication
American Academy of Otolaryngology–Head and Neck Surgery (AAO-HNS)	www.entnet.org	• Largest professional organization of otolaryngologists	• AAO-HNS Bulletin Otolaryngology–Head and Neck Surgery • AAO-HNS ENT Health
American Tinnitus Association (ATA)	www.ata.org	• The United States' leading and longest-serving organization solely dedicated to advancing tinnitus research, treatment, and patient support.	• Tinnitus Today • Current Tinnitus Research
American Speech-Language-Hearing Association (ASHA)	www.asha.org	• Professional association of >166,000 audiologists, speech-language pathologists, and hearing scientists	• American Journal of Audiology • ASHA Leader
American Academy of Audiology (AAA)	www.audiology.org	• Largest professional organization of audiologists	• Audiology Today • Journal of the American Academy of Audiology
Hearing Health Foundation (HHF)	www.hearinghealthfoundation.org	• Largest private funder of hearing research	• Hearing Health Magazine
Tinnitus Research Initiative Foundation (TRI)	http://www.tinnitusresearch.org/	• Research foundation based in Germany • Hosts worldwide collaborations of tinnitus investigators with workshops and conferences	• TRI Newsletter • Proceedings of the conferences and workshops
National Institute on Deafness and Other Communication Disorders (NIDCD)	www.nidcd.nih.gov	• National Institutes of Health institute that supports and conducts research on hearing healthcare issues, including tinnitus	• NIDCD News Updates • Inside Newsletter
Tinnitus UK	www.tinnitus.org.uk	• British organization that provides support and education about tinnitus • Hosts annual conferences • Funds research	• Quiet quarterly magazine • FOCUS newsletter
Hyperacusis Network	www.hyperacusis.net	• Support/education for those suffering from sound sensitivity and pain	• Message

evidence-based approaches to tinnitus management. These would include audiologists, otolaryngologists/otologists, psychiatrists, and psychologists.

Statement 8: Hearing Aid Evaluation

Clinicians should recommend a hearing aid evaluation for patients with hearing difficulties and persistent, bothersome tinnitus.

Evidence Strength: *Recommendation* based on observational studies with a preponderance of benefit over harm.

Action Statement Profile: 8

- **Quality improvement opportunities:** To promote awareness of the beneficial effect of hearing aids on tinnitus and encourage utilization of this first-line audiologic intervention for patients with tinnitus, even those who might otherwise be marginal hearing aid candidates.
- **Aggregate evidence quality:** Grade C, based on observational studies.
- **Level of confidence in the evidence:** High.
- **Benefits:** Raise awareness of potential beneficial effects of hearing aids on tinnitus; ensure that patients receive proper guidance regarding benefits, expectations, and costs of hearing aids; provide patients who have hearing loss with access to information and interventions that may alleviate hearing loss and improve function/QOL.
- **Risks, harms, costs:** Direct cost associated with clinician-provided hearing aid evaluation and, if indicated, to dispensing of a hearing aid.
- **Benefit-harm assessment:** Preponderance of benefit over harm.
- **Value judgments:** Perceived lack of awareness regarding the ability of hearing aids to improve QOL for patients with tinnitus.

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- **Intentional vagueness:** The level of hearing loss is not specified because hearing loss–associated tinnitus may benefit from hearing aids even if the hearing loss is mild, or even if there is a more severe unilateral SNHL associated with the tinnitus.
- **Role of patient preferences:** Patient may accept or decline the recommendation to pursue a hearing aid evaluation.
- **Exceptions:** None.
- **Policy level:** Recommendation.
- **Differences of opinion:** None.
- **Changes from the 2014 Guidelines**: None.
- **Implementation considerations:** None.

Supporting Text

The purpose of this statement is to recommend a hearing aid evaluation when personal amplification (eg, prescribed or over-the-counter [OTC] hearing aids) is a possible intervention for patients with persistent, bothersome tinnitus who report hearing difficulties that, in the clinician's judgement, would be amenable to hearing aid use. Hearing aids and OTC devices are forms of personal amplification that include custom and noncustom fit ear-level devices. Sound enrichment devices, including non-amplifying ear-level sound generators used for tinnitus masking are discussed in KAS 10. Hearing aids have potential to improve patients' QOL by supporting communication as well as managing tinnitus effects. Barriers to hearing aid use, such as stigma, cost, and the lack of direct correlation between pure-tone audiometric status and tinnitus severity likely contribute to the underutilization of hearing aids in cases of bothersome tinnitus accompanied by hearing difficulties. In the general population, fewer than 30% of individuals of age 70 or greater years, and 16% of those ages 20 to 69 years, who could benefit from hearing aids have ever used them[182] and rates of usage among patients bothered by tinnitus are likely similar.

The recommendation of hearing aids for tinnitus management reflects evidence from empirical and case-based investigations whose rationale centers on clinical management of hearing difficulties, with tinnitus reduction a potential additional benefit. Note that hearing difficulties that may benefit from amplification need not be manifested as pure tone hearing thresholds outside the normative limit of 20 dB HL. When tinnitus and hearing difficulties co-occur, addressing hearing concerns is a logical first step in the care of the patient.[172] While studies of patient outcomes with hearing aid use demonstrate reduced tinnitus intrusiveness among consistent users of personal amplification, the conclusions and generalizability of prospective intervention studies employing hearing aids specifically for tinnitus management have been limited by inadequate control conditions, study power, selection bias, short treatment duration, and confounding factors related to additional treatments including counseling components and sound therapy, as well as the idiosyncratic tinnitus fluctuations experienced by some patients.[183-188] In 2025, a well-designed multicenter randomized trial of single versus combination treatment was published that provided evidence of benefit of hearing aids for tinnitus (primary outcome, improvement in THI), both with and without additional structured counseling.[189] Hearing aid amplification can improve the QOL of a patient with tinnitus by supporting management of co-morbid hearing loss and thereby reducing listening effort and hearing-related stress. Based on long-term retrospective studies, patients suffering from hearing loss and tinnitus receive at least modest benefit from amplification in coping with their tinnitus.[187,190,191]

Personal amplification can reduce both tinnitus intrusiveness and the listening effort required for effective communication even in cases of mild hearing loss,[192] thereby improving patients' QOL. Results from retrospective studies are mixed with some demonstrating correlations between hearing aid use time and tinnitus reduction, and others showing no effect. Studies of sound processing strategies also produce mixed results at least in part because amplification that supports communication may not be optimal for tinnitus relief, and vice versa. Conclusions drawn from such studies lack generalizability for the aforementioned methodological limitations, in addition to interindividual differences related to tinnitus pathophysiology and the natural history of a patient's tinnitus.

Barriers to hearing aid use include, in addition to geographical issues, stigma associated with device appearance, inadequate perceived benefit, and cost, as in many cases, insurance either does not support the purchase, or addresses only a portion of the cost. Additional issues related to skin hypersensitivity, impacted cerumen, recurrent otitis externa, and minor discomfort from hearing aid fittings may be managed with routine clinical intervention.[193]

OTC hearing aids are a regulated category intended for adults 18 years and older with perceived mild to moderate hearing loss that were authorized by the FDA in 2022. They can be purchased without a prescription or mandatory professional fitting. There is no direct evidence that OTC hearing aids improve tinnitus-related outcomes, as the evidence base for hearing aids and tinnitus is based on professionally fitted (prescription) amplification. OTC devices may be an option for patients motivated to trial amplification because of access or cost; however, a hearing aid evaluation remains valuable to (a) confirm candidacy and identify medical/audiologic red flags, (b) align expectations regarding tinnitus versus communication benefit, (c) counsel on safe output/comfort, and (d) facilitate follow-up adjustment or transition to prescriptive amplification when needed.

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Despite a lack of high-quality evidence, hearing aid use for the management of bothersome tinnitus may be justified for several reasons. Sereda et al identified several putative intervention effects afforded by hearing aids as identified by practitioners who routinely provide clinical tinnitus management services.[194] Among the effects specified by respondents, personal amplification provided by prescriptive hearing aids, or OTC devices, were expected to reduce listening effort, improve the capacity of environmental sounds to interfere with tinnitus perception, as well as support use of phones and other sound-generating devices. Consideration of personal amplification's minimal risk in light of potential benefits related to tinnitus management supports hearing aid evaluation for patients with tinnitus and documented or self-report of hearing loss.[195] The GUG considered these potential benefits in addition to hearing aid influence on health-related QOL measures and reports. Considering the minimal risk associated with hearing aid fitting along with the potential for hearing aids to improve QOL while reducing tinnitus intrusiveness justified hearing aid evaluation as a recommendation for patients with tinnitus and hearing difficulties.

Statement 9: Cochlear Implants

Clinicians should refer patients with persistent, bothersome tinnitus for cochlear implant evaluation when they meet audiologic criteria for referral.

Evidence Strength: *Recommendation* based on systematic reviews of observational studies with a preponderance of benefit over harm.

Action Statement Profile 9:

- **Quality improvement opportunity:** Promote cochlear implant evaluation for tinnitus patients with hearing loss amenable to this treatment who have not considered this as a treatment for tinnitus.
- **Aggregate Evidence Quality:** B.
- **Level of confidence in evidence:** Medium, as tinnitus measures were secondary outcomes of most series.
- **Benefits:** Hearing benefits and QOL benefits of CI for hearing deficits that meet appropriate audiologic criteria, concomitant tinnitus impact benefits.
- **Risk, Harm, Cost:** Surgical risks of CI, failure to improve or even worsen tinnitus, loss of residual hearing, costs, unrealized expectations.
- **Benefit-Harm Assessment:** Preponderance of benefits over harms.
- **Value Judgments:** CI may be underused, patients with severe hearing loss may not benefit from other interventions.
- **Intentional Vagueness:** Specific CI candidacy criteria are not specified here as they have evolved and may continue to evolve.
- **Role Of Patient Preferences:** Large.
- **Exceptions:** None.
- **Policy level:** Recommendation.
- **Differences of Opinion:** None.
- **Changes from 2014 Guidelines**: This is a new key action statement.
- **Implementation Considerations:** Cochlear implant candidacy criteria have changed in the past and may change in the future.

Supporting Text

The purpose of this statement is to advise clinicians to refer patients with tinnitus for cochlear implantation if they meet established audiologic candidacy criteria for the ear affected with tinnitus. Cochlear implants are a well-established treatment for individuals with severe to profound unilateral or bilateral sensorineural hearing loss (SNHL), regardless of the presence of tinnitus.[196] The GUG does not specify exact audiologic criteria here, as candidacy requirements continue to evolve and vary among payers. However, at the time of publication of this guideline, referral should be considered for patients with severe sensorineural hearing loss who derive limited benefit from appropriately fitted hearing aids.[197] Tinnitus is a common and often distressing symptom among cochlear implant candidates, and it can significantly impair quality of life. Among CI candidates, the prevalence of pre-implant tinnitus has been reported to range from 52% to 86%.[198,199] In addition to restoring auditory perception, cochlear implantation has been shown to improve quality of life and reduce tinnitus severity in a substantial proportion of patients.[200] Despite this, the cochlear implant utilization rate (proportion of eligible individuals that receive implants) remains low. Among individuals who meet standard audiometric candidacy, only 12.7% receive a cochlear implant.[201] When including those with single-sided deafness (SSD) or asymmetrical hearing loss, which can benefit from cochlear implantation, the utilization rate drops to approximately 2%.[201] Recognizing the combined benefits of cochlear implantation in hearing rehabilitation, tinnitus relief, and quality-of-life improvement may support more timely referrals and help address underutilization.

While cochlear implantation is primarily intended to restore hearing, the potential for tinnitus relief, especially in patients with SSD, should not be overlooked during candidacy evaluations. Tinnitus-related outcomes have been assessed using validated, self-reported instruments such as the Tinnitus Functional Index (TFI), Tinnitus Handicap Inventory (THI), Tinnitus Questionnaire (TQ), and Visual Analog Scale (VAS), which measure tinnitus severity and quality-of-life impact. A systematic review has demonstrated that cochlear implantation leads to long-term (>12 months) improvement in tinnitus among individuals with single-sided deafness and disabling tinnitus—both in patients for whom tinnitus was the primary complaint and those for whom it was not.[202] In a meta-analysis of 247 patients with SSD, Levy et al reported partial tinnitus resolution in 74.5% and complete

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resolution in 14.9% of patients.[203] Additionally, a 2024 meta-analysis reported mean differences of −14.02 in the THI, −15.85 in the TQ, and −3.12 in the VAS, demonstrating clinically meaningful improvements in tinnitus severity following CI.[196] Tinnitus reduction has also been demonstrated in patients with bilateral hearing loss after either unilateral or bilateral cochlear implantation.[196,204-207]

Although systematic reviews and meta-analyses have noted heterogeneity and a risk of bias among included studies, findings remain consistent with broader evidence documenting reductions in tinnitus loudness, distress, and annoyance after CI.[198,200,202,204,208-210] A randomized controlled trial (RCT) involving patients with SSD and tinnitus found that CI—compared to BCDs (Bone Conduction Devices), CROS (Contralateral Routing of Signals), and no treatment—led to the largest reduction in tinnitus impact scores, with improvements observed as early as 3 months post-CI.[211] One proposed mechanism of tinnitus suppression after cochlear implantation is the redirection of attention from tinnitus to environmental sounds. However, a prospective trial of 10 patients with single-sided deafness demonstrated tinnitus suppression with intracochlear electrical stimulation independent of external sound, suggesting that additional mechanisms are involved.[212] Other proposed mechanisms include normalization of central auditory activity through the restoration of afferent input from direct electrical stimulation and the reactivation of tonic inhibitory neural networks.[213]

Given the evidence of benefit, clinicians are encouraged to engage in shared decision-making and ensure patients have access to all potentially life-improving interventions. While cochlear implantation offers substantial benefits, patients should be counseled on potential risks, including surgical complications and the possibility of tinnitus worsening or emerging postoperatively. Such outcomes have been documented in the literature.[198,199,204,206,210,214] A meta-analysis found that 3% of 247 patients experienced worsening of tinnitus following cochlear implantation.[203] In a randomized controlled trial including 38 patients with bilateral SNHL, 6 patients developed tinnitus following implantation.[206] Additionally, a systematic review of cohort studies found that 7.3% of 153 patients with single-sided deafness experienced no change in their tinnitus following cochlear implantation.[210]

It is important to consider the cost of cochlear implantation and that it varies based on the device manufacturer, hospital, and insurance payer. Currently, Medicare covers CIs only for patients with bilateral moderate-to-profound SNHL.[215] This limitation excludes many patients who could benefit, such as those with single-sided deafness and disabling tinnitus. CI candidacy criteria continue to evolve, and expanding indications reflect the growing body of evidence supporting broader clinical benefit. Given the documented improvements in auditory function, quality of life, and the potential for tinnitus relief, referral for cochlear implant evaluation is a reasonable and evidence-based recommendation for patients with tinnitus who meet audiologic criteria for CI in the ear affected with tinnitus.

Statement 10: Sound Enrichment

Clinicians may recommend sound enrichment to patients with persistent, bothersome tinnitus.

Evidence Strength: *Option* based on randomized controlled trials, with inconsistent results and a predominance of potential benefit over potential harms.

Action Statement Profile: 10

- **Quality improvement opportunity**: To promote awareness and utilization of sound enrichment as a reasonable management option in patients with persistent, bothersome tinnitus.
- **Aggregate evidence quality:** Grade B, based on RCTs with methodological concerns.
- **Level of confidence in the evidence:** Medium, as strength of evidence is low.
- **Benefits:** Access to technology/devices/techniques that may relieve tinnitus; improve QOL, sleep, and concentration.
- **Risks, harms, costs:** Consequences of recommending an intervention of uncertain efficacy; promoting false hope; financial toxicity/costs associated with medical devices.
- **Benefit-harm assessment:** Benefits outweigh harms.
- **Value judgments:** The GUG felt the prior guideline did not emphasize the utility of sound enrichment.
- **Intentional vagueness:** None.
- **Role of patient preferences:** Significant role in choosing among the available options.
- **Exceptions:** None.
- **Policy level:** Option.
- **Difference of opinion:** The GUG debated whether sound enrichment should be a *recommendation* or an *option*. After careful consideration of evidence, 15 of 18 panel members voted to make this an *option*.
- **Changes from the 2014 Guidelines:** The term *sound therapy* was changed to *sound enrichment*.
- **Implementation considerations:** None for self-guided sound enrichment. Level of qualification/training of clinicians prescribed sound enrichment devices, access to experienced clinicians of sound enrichment devices.

Supporting Text

The purpose of this statement is to inform clinicians about the role of sound enrichment in mitigating persistent, bothersome tinnitus. The GUG intentionally used the term "sound enrichment" versus "sound therapy" because it

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more broadly refers to the use of sound, regardless of delivery mode or sound type, to alter tinnitus perception, the reaction to tinnitus, or both to improve the ability to cope with tinnitus. Sound enrichment encompasses a wide array of non-customized, customized, proprietary, and nonproprietary sound types (eg, broadband noise, notched noise or music, tinnitus-matched sounds, etc.) that can be delivered by nonmedical (eg, earphones, music players, tabletop sound machines) or medical (eg, hearing aids, tinnitus treatment systems) devices (**Table 18**). Patients have many options ranging from simple self-selected sounds to prescribed treatment protocols and devices. Hearing aid use for tinnitus relief is discussed in KAS 8 and will therefore not be further discussed here.

Sound enrichment includes what has historically been referred to as sound therapy and has been implemented in many ways since the first "formal" sound enrichment, tinnitus masking, was introduced in the 1970s.[216,217] Sound enrichment can be used independently for self-management but may be more beneficial when a clinician is involved and guiding the implementation of sound enrichment and coping strategies, or when combined with behavioral therapies such as CBT, discussed in KAS 11.[218-220] Sound enrichment is thought to provide relief from tinnitus[221] and reduce the emotional consequences of tinnitus. It may promote habituation to the tinnitus by reducing the contrast between the tinnitus and environmental sound,[216,217,222] induce a sense of relief from stress or tension caused by tinnitus using soothing sounds,[223,224] or provide sounds that are interesting with the goal of distracting the patient's attention away from the tinnitus (active attention diversion).[223] The specific parameters of sound therapy that provide optimal tinnitus benefit have not yet been firmly established. The most recent Cochrane review evaluating ear-level sound enrichment[225] found no differences in outcomes between hearing aids alone, sound generators alone, or combination devices. The authors note, however, that none of the studies compared ear-level sound enrichment to placebo or waitlist control, and they therefore concluded that using ear-level sound enrichment might result in little or no reduction in tinnitus functional impact.

It is important to note that while many RCTs evaluating sound enrichment do not control for the effects of educational counseling and interaction with a tinnitus clinician, sound enrichment can potentially improve the efficiency of intervention—that is, patients achieve improvement in the emotional and functional consequences more quickly.[219] A potential mechanism by which sound enrichment can mitigate bothersome tinnitus is the induction of residual inhibition. Some individuals experience residual inhibition following total or partial masking (ie, tinnitus suppression or temporary disappearance of the tinnitus sensation after exposure to an external sound), but the efficacy of sound enrichment targeting residual inhibition has not been established.[226]

Sound Enrichment Use Time and Volume

There is considerable variability in recommended use time and volume of ear-level devices. An RCT evaluating use

Table 18. Examples of Sound Enrichment Options

Sound type	Source	Delivery	Features/notes
Broadband noise	• Apps • Ear-level sound generators • Hearing aids • Sound spa	• Earbuds/earphones • Hearing aids • Prescription tinnitus devices • Speaker • Tabletop sound machine	• Easily accessible • Reduces perceptual contrast • Broadband includes pink noise, white noise, brown noise, etc.
Environmental sound	• Apps • Fan • Sound spa • TV • Nature	• Earbuds/earphones • Hearing aids (via Bluetooth) • Speaker • Tabletop sound machine	• Easily accessible • Reduces perceptual contrast
Notched/Shaped noise	• Hearing aids • Online programs • Apps	• Earbuds/earphones • Hearing aids • Speaker	• Requires tinnitus pitch matching, either by an audiologist or using an automated system provided by the program app or device
Music	• Apps • Online • Tinnitus devices	• Earphones • Hearing aids • Prescription tinnitus devices • Speaker	• Easily accessible • Facilitates relaxation and/or distraction

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time of headphone-delivered sound enrichment with broadband noise found that longer use times of 3 to 5 hours per day resulted in larger improvements in patient reported outcome measures (PROM) compared to use time of 1 hour a day, and notably, none of the groups received educational counseling.[227]

Sound enrichment volume can be adjusted to provide partial or total masking. Total masking refers to a volume level of external sound that eliminates the perception of tinnitus, while partial masking reduces but does not eliminate perception. Neither approach has been established as superior, therefore, patients can choose a volume level that is comfortable and does not interfere[228] with hearing and communication.

Sound Enrichment with Customized Sounds and Music

Examples of customized sound enrichment are notched music, notched noise, and tinnitus-matched sound. Inserting a notch centered over the tinnitus pitch is thought to decrease hyperactivity in the corresponding regions of the central auditory system, thereby diminishing the perception of tinnitus.[229] Evidence to support the benefits of notched music or notched noise is generally of poor quality, and study outcomes are variable.[50,230-235] Studies evaluating other types of customized sounds, such as mixed pure tones[236] or tinnitus-matched sounds[237] are generally of low quality, and therefore support for customized sounds is limited. More recent studies of music therapy indicate benefit.[238,239] There is insufficient evidence to recommend novel sound enrichment approaches such as binaural beats[238,240] and multi-tone sound therapy.[241]

Sound Enrichment with Clinician Support

Although the evidence for prescribed sound-based treatment protocols used in current practice is not strong, several studies reinforce the value of sound enrichment, especially when combined with regular counseling from a knowledgeable tinnitus healthcare clinician.

Tinnitus Retraining Therapy (TRT) is a well-established treatment protocol combining directive educational counseling and sound enrichment; however, the evidence does not support the superiority of TRT over other tinnitus management protocols that involve sound enrichment and ongoing education and counseling.[242,243] RCTs of fair quality have failed to demonstrate differences between full TRT, partial TRT, and standard of care counseling,[244] or between TRT, tinnitus masking, and tinnitus education (all groups used ear-level sound generators).[220] Both RCTs revealed reductions in tinnitus functional impact, with no significant differences between groups. Of particular note is the support role of the audiologist providing ongoing education. Sound enrichment combined with CBT may also be beneficial.[245,246]

Harm versus Benefit of Sound Enrichment

Despite the paucity of systematic reviews and RCTs demonstrating clear-cut evidence for self-selected or prescribed sound enrichment in alleviating bothersome tinnitus, there is an extensive body of literature describing the underlying rationale, clinical methodologies, and success rates for different approaches.[247-250]

No side effects or morbidity have been reported from the use of any sound therapy intervention or placebo therapy.[251] Prescribed sound enrichment devices have the disadvantages of high cost, inconvenience, and dissatisfaction. Therefore, patients seeking guided sound enrichment must be provided with realistic expectations regarding potential outcomes as well as costs, both emotional and financial, associated with prescribed sound enrichment devices.

Statement 11: Cognitive Behavioral Therapy

Clinicians should recommend Cognitive Behavioral Therapy (CBT) to patients with persistent, bothersome tinnitus.

Evidence Strength: *Recommendation* based on randomized controlled trials, with a predominance of benefit over harms.

Action Statement Profile: 11

- **Quality improvement opportunity:** To promote awareness and utilization of CBT as an effective management option in patients with persistent, bothersome tinnitus.
- **Aggregate evidence quality:** Grade A, based on multiple systematic reviews of RCTs.
- **Level of confidence in the evidence:** Moderate, based on concerns about methodology and sample size of trials.
- **Benefits:** Treatment of depression and anxiety; improved QOL, tinnitus coping skills, and adherence to other tinnitus treatments.
- **Risks, harms, costs:** Direct cost; time involved (multiple sessions, 1-2 hours each); availability of services may be limited.
- **Benefit-harm assessment:** Preponderance of benefit.
- **Value judgments:** None.
- **Intentional vagueness:** None.
- **Role of patient preferences:** None.
- **Exceptions:** None.
- **Policy level:** Recommendation.
- **Differences in opinion:** None.
- **Changes from the 2014 Guidelines:** None.
- **Implementation considerations:** Level of qualification/training of the clinician providing CBT, access to care; in person versus telehealth (for improved access) versus online; intentionality for

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treatment tinnitus vs. symptoms of anxiety and/or depression, cost of CBT.

Supporting Text

The purpose of this statement is to support the use of behavioral interventions, most prominently CBT, for persistent, bothersome tinnitus. Tinnitus patients may benefit from behavioral interventions in managing their symptoms. Evidence from systematic reviews and randomized controlled trials demonstrates that CBT, acceptance and commitment therapy (ACT), and mindfulness-based psychotherapy can reduce tinnitus-related distress and improve quality of life.[252,253] The psychotherapy model with the strongest evidence base for application to general medical clinics for the management of tinnitus-related distress is CBT[253] (**Figure 2**).

CBT is recommended both for depressive and anxiety disorders as well as for nonpsychiatric conditions like tinnitus, chronic pain, and headache. CBT is typically conducted by a psychiatrist, psychiatric nurse practitioner, or clinical psychologist, although other clinicians may be trained and experienced in CBT. CBT is classically conducted in face-to-face sessions, though with modern care models, it has been expanded to telehealth video-based sessions, as well as online and app-based programs. A typical course of CBT is highly structured, involves patient homework to practice CBT skills, and is time-limited (up to 12 1-hour sessions is typical). CBT teaches skills to identify negative thoughts that result in distress and to restructure them so the thoughts are more accurate or helpful (**Table 19**).

For example, a tinnitus patient may have the thought, *I won't enjoy dinner because I won't be able to hear over my tinnitus*, which leads to the behavior, *Do not go to dinner*, and the feeling, *Sad because my wife went to dinner without me*. With CBT, the alternate thought could be, *I might not be able to hear over my tinnitus but I might still enjoy the food and atmosphere*, with the resulting alternate behavior, *Go to dinner and see if you enjoy yourself*, and an alternate outcome/feeling, *Enjoying the food and feeling content*. The treatment also includes behavioral interventions such as learning relaxation techniques, exposure to feared stimuli, instruction on sleep hygiene, and sound enrichment.

A beneficial effect of CBT for patients with tinnitus is suggested by several systematic reviews. Andersson and Lyttkens[254] analyzed 18 studies of psychological treatments for tinnitus and concluded that CBT was more effective than behavioral treatments alone, such as relaxation, hypnosis, biofeedback, educational sessions and stress management/problem-solving. A Cochrane review by Martinez-Devesa and colleagues[255] later found CBT to offer a significant improvement in the symptoms of depression associated with tinnitus and QOL (decrease of global tinnitus severity) in 8 trials but did not find any effect on subjective tinnitus loudness in 6 trials. Hesser et al.[256] reviewed 15 studies and found sustained benefits of CBT on tinnitus-specific outcome measures and smaller benefits for anxiety and depressive symptom outcomes. Hoare et al[256] reviewed strategies for tinnitus management identified in a guideline from the United Kingdom, of which only CBT had adequate data for statistical pooling, that showed moderate efficacy for CBT to be reasonably established. In contrast to the reviews just discussed, the evidence report from Agency for Healthcare Research and Quality (AHRQ) found low strength of evidence to support CBT, but their review

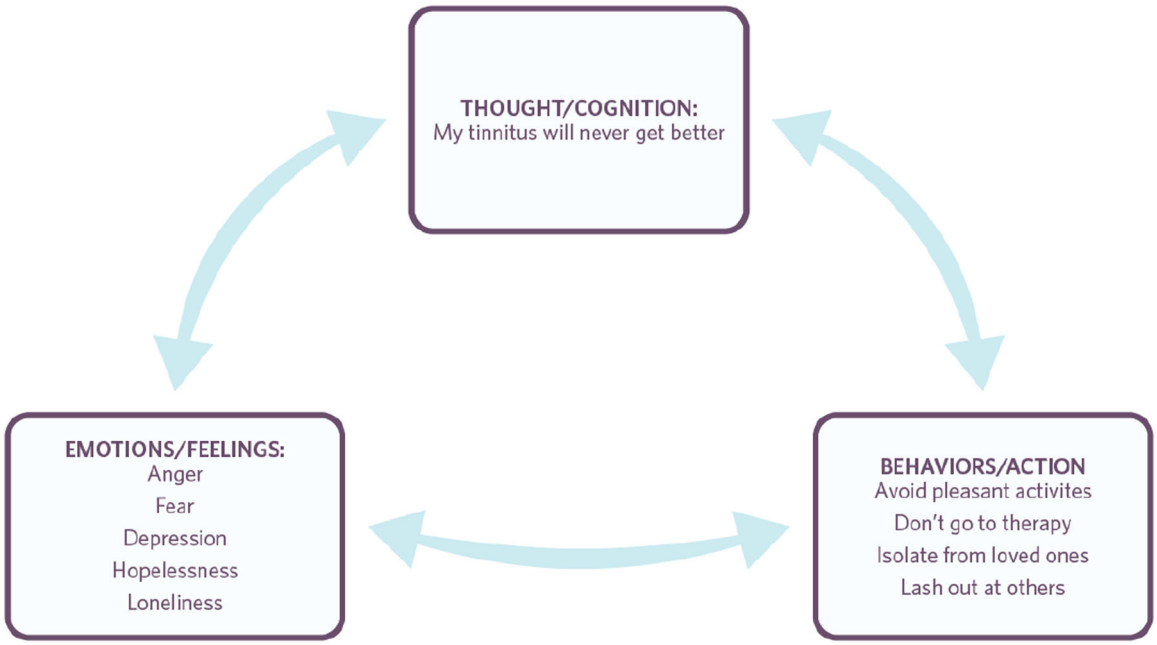


Figure 2. The thoughts-feelings-behaviors cycle is central to cognitive behavioral therapy.

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Table 19. Example Thoughts and Alternate Thoughts about Tinnitus

Baseline thought	Alternate thought	Technique
I have tinnitus; life is rotten.	I have tinnitus and parts of life are rotten and parts of life are good.	Identifying thought distortion—discounting the positive
I'll never get better.	I might get better; I might not.	Identifying thought distortion—predicting the future
Tinnitus never goes away; I can't shut it off.	Sometimes the tinnitus is not as loud.	Identifying thought distortion—all or none thinking
No one can be happy if they have tinnitus.	Some people have learned to be happy and still have tinnitus.	Identifying thought distortion—focusing on negative
Tinnitus makes my life miserable.	I have tinnitus and sometimes I am miserable, but not every minute of the day.	Identifying thought distortion—all or none thinking
I cannot stand this another minute.	I would prefer not to have this another minute, but I have been tolerating it and can continue to do so. I can also listen to some relaxing music or go fishing and distract myself or enjoy myself a bit.	Identifying thought distortion—predicting the future
I can't cope with this; there is nothing I can do about it.	I have been coping with it, perhaps not so well; maybe I can learn some coping techniques if I go to therapy.	Identifying thought distortion—predicting the future
I can't escape from this; there is nothing I can do about this.	My tinnitus is present all the time, but the volume fluctuates and sometimes it is not as noticeable, like when I am at the beach.	Identifying thought distortion—all or none thinking
I can't sleep; I won't be able to function tomorrow, and then I can't make a living.	I have had a rough night of sleep; however, I have been able to work many times in the past with little sleep. I am not as efficient with work when I have slept poorly, but it is unlikely I will get fired. If they keep X around, I feel confident I won't get fired. Even on my worst day, my work is better than that of X.	Identifying thought distortion—catastrophizing

included studies of interventions that did not include a cognitive therapy component.[218,251,253]

A 2020 Cochrane Review[253] of CBT for tinnitus reviewed 28 studies with a total of 2,733 participants. CBT duration ranged from 3 to 22 weeks. Fourteen studies compared CBT to no intervention/wait list control. The reviewers concluded that CBT may improve the impact of tinnitus on QOL and improve THI. CBT was associated with a slight reduction in depression symptoms. There was an absence of evidence on improvement at 6- and 12-month follow-up or for the impact of CBT on anxiety. The majority of the included studies had high, moderate, or unclear risk of bias. A systematic review and network meta-analysis of CBT for tinnitus examining a total of 31 randomized controlled trials was consistent with prior literature supporting CBT as an effective treatment for tinnitus.[257] Guided self-administered CBT had larger effect sizes, while only face-to-face CBT led to statistically significant changes in health-related QOL. There were also improvements in depression and anxiety associated with CBT.

Although CBT may provoke temporary distress as patients confront tinnitus-related thoughts and behaviors, trials to date have not reported serious adverse events associated with its use for tinnitus.[253] Access and cost remain important considerations, as out-of-pocket expenses may be high. Internet-based CBT improves access, reduces clinician time, and can be delivered at lower cost, though adherence is often lower than face-to-face care.

CBT Modes of Delivery

CBT can be delivered by various models, guided or self-led, and in an individual or group setting, and can be accessed via self-directed online or app-based programs (**Table 20**). Across delivery modes, CBT consistently reduces tinnitus-related distress, though accessibility and adherence vary. Traditional in-person therapy remains effective but limited by cost and availability. Guided internet-based CBT is supported by multiple RCTs showing significant reductions in tinnitus distress, along with comorbid insomnia, depression and hyperacusis, with outcomes often comparable to face-to-face care and sustained for up to 12 months.[245,258-260] Patient satisfaction is generally high, but dropout and variable engagement are common, with therapist or audiologist guidance shown to improve adherence compared to self-directed programs. While self-led online and app-based programs are easily accessible and cost-efficient and have promising recent trial data, we await more long-term evidence and assessment of compliance and efficacy.

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Table 20. Cognitive Behavioral Therapy: Modes of Delivery

Mode of delivery	What the evidence shows	Considerations for clinicians
In-person, individual counseling	Significant reduction in tinnitus severity, distress, and comorbid sleep/mood problems after structured CBT programs[236,261]	Strong benefit but studies are small and short-term. Limited scalability due to cost, clinician time, and patient travel.
In-person, group counseling	Large RCTs show robust reductions in tinnitus distress and fear[159]	Efficacy demonstrated in structured group programs. Limited availability outside specialized centers; some patients may be less comfortable in group settings.
Telehealth with clinician (individual or group)	Remote CBT combined with sound enrichment improved THI and psychological symptoms[246]	Supports feasibility of telehealth. Limitations: combined intervention blurs CBT-specific effects; no long-term follow-up data.
Guided internet-based CBT (iCBT) with therapist/ audiologist support)	Multiple RCTs show significant reductions in tinnitus distress, depression, insomnia, and hyperacusis, with some trials showing similar outcomes to traditional CBT and lasting up to 12 months[258-260]	Strongest evidence base among non–in-person modalities. Main limitations: dropout and inconsistent engagement; requires digital literacy. Therapist support improves adherence but adds resource demand.
Self-led internet-based CBT (minimal or no therapist support)	Reduces tinnitus distress, with outcomes comparable to group CBT. Minimal therapist input can still yield benefit.[262-264]	High attrition. Less effective in patients with high catastrophizing; early progress predicts outcome.
App-based CBT (smartphone programs)	Recent RCTs report clinically meaningful reductions in tinnitus distress, stress, anxiety, and sleep disturbance.[69,245,265,266]	Evidence base is only recent. Adherence remains an issue (dropout >30% in some studies). Requires smartphone literacy and motivation.

Additional Behavioral Interventions for Tinnitus

Another psychotherapy model applicable to tinnitus is ACT, which focuses on the patient accepting the reality of their illness and developing illness-specific coping strategies to manage the symptomology of the illness. Like CBT, ACT typically is time-limited and focused on patient empowerment in managing symptoms. In a systematic review and meta-analysis of 60 randomized controlled trials, ACT demonstrated small but positive effect sizes across psychiatric and somatic disorders, including tinnitus.[34] Additionally, mindfulness-based interventions have demonstrated benefit in reducing tinnitus-related distress, though the evidence base remains smaller than that for CBT.[267,268] Mindfulness is a meditative behavioral approach that emphasizes present-moment awareness, nonjudgemental acceptance of thoughts and feelings, and relaxation through structured beathing exercises.

Statement 12: Therapy With Medicines

Clinicians should not routinely recommend antidepressants, anticonvulsants, anxiolytics, or intratympanic medications for a primary indication of treating persistent, bothersome tinnitus.

Evidence Strength: *Recommendation against* based on systematic reviews and RCTs with methodological concerns, with a preponderance of benefit over harm.

Action Statement Profile: 12

- **Quality improvement opportunity**: To decrease the use of medications that may have no benefit and have significant potential side effects in the management of patients with tinnitus.
- **Aggregate evidence quality:** Grade B, based on RCTs with methodological concerns and systematic reviews demonstrating a low strength of evidence.
- **Level of confidence in the evidence:** Medium regarding the lack of efficacy of medical therapy as a primary treatment for persistent, bothersome tinnitus, since several studies with methodological flaws, bias, and lack of power did show some benefit in certain tinnitus outcome measures.
- **Benefits:** Avoid unproven therapy, side effects/adverse events (including tinnitus), and false hope; reduce expense. Avoid use of medications that are not approved for use in geriatric population.
- **Risks, harms, costs:** Denying some patients benefit.
- **Benefit-harm assessment:** Preponderance of benefit over harm.
- **Value judgments:** Although these therapies appear to be beneficial in some studies, the evidence from systematic reviews and RCTs is insufficient to justify routine use in managing patients with tinnitus, especially given the known harms, cost of therapy, and potential for some medications (eg, antidepressants) to worsen tinnitus.

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- **Intentional vagueness**: The term routinely is used to acknowledge there may be individual circumstances for which clinicians and patients may wish to pursue a medical therapy.
- **Role of patient preferences:** Limited; a trial of medication may be administered based on individual circumstances.
- **Exceptions:** Patients with depression, anxiety, seizure disorders, migraine, or other neurologic conditions that constitute an indication for pharmacologic therapy independent of tinnitus. Patients with audiologic reasons, such as but not limited to sudden hearing loss, acoustic trauma, or Ménière's disease, that constitute an indication for intratympanic steroids.
- **Policy level:** Recommendation against.
- **Differences in opinion:** None.
- **Changes from 2014 Guidelines:** Changed "Medical Therapies" to "Therapy with Medicines" for clarity.
- **Implementation considerations:** None.

Supporting Text

The purpose of this statement is to avoid or discourage the routine use of medications for tinnitus, as medications have not been shown to consistently alleviate tinnitus and may have adverse effects. At this time, there are no medications approved by the US Food and Drug Administration (FDA) for treatment of tinnitus. No medications have been shown to reliably eliminate or reduce tinnitus perception. There are significant methodological limitations in the available randomized controlled trials and systematic reviews of studies of medications for tinnitus. Benefits of the recommendation against the routine use of medications in the treatment of tinnitus include avoiding unproven therapy, avoiding side effects (including production or worsening of tinnitus), avoiding unsubstantiated expectations, avoiding the use of medications that may be harmful in certain patient populations (such as older adults),[269] avoiding the potential for substance use disorder (American Geriatrics Society Beers Criteria® Update Expert Panel, 2023), and avoiding unnecessary medication costs. This key action statement does not apply to those patients with comorbid disorders, such as depression, anxiety, seizure disorders, migraine, or other neurologic conditions that constitute an indication for pharmacologic therapy independent of tinnitus or to patients with audiologic reasons, such as but not limited to sudden hearing loss or Ménière's disease, that constitute an indication for intratympanic steroids.

The report prepared for the Agency for Healthcare Research and Quality (AHRQ) Comparative Effectiveness Research program analyzed 13 studies regarding the use of antidepressants, neuromodulators, and other drugs such as intratympanic steroid injections in relation to tinnitus-specific QOL and subjective loudness outcomes.[251] While the review identified 6 studies that favored treatment over control for tinnitus-specific QOL outcomes,[270-274] and 5 studies that favored treatment over control for subjective tinnitus loudness outcomes,[270,274-276] selection and other biases, small sample sizes, and imprecise effect estimates led to an assessment of low or insufficient strength of evidence for these outcomes.

More recently, Li et al[277] and Chen et al[278] performed a Network Meta-Analysis (NMA) of randomized controlled trials to evaluate the effectiveness of a range of medications used to manage tinnitus without a specific cause. Li et al[277] included 60 RCTs and concluded that antioxidant and GABA agonists therapy might be promising choices for subjective tinnitus, however rigorously designed research needs to be conducted. The review by Chen at al[278] included 36 RCTs and determined that pharmacologic interventions that were noted to have a central effect, such as amitriptyline, acamprosate, and gabapentin, as well as those with anti-inflammation or antioxidant effect, such as intra-tympanic dexamethasone injection plus oral melatonin, were associated with improvement in tinnitus severity and response rate compared to placebo or control. No data were noted on the ages of participants in the studies included in the analysis. Additionally, the included studies used varying subjective measures of response, and there was no effect on quality of life, suggesting the need for further studies using standardized assessments.

Antidepressants

Antidepressants are not recommended for treating tinnitus based on results from 9 RCTs and 1 Cochrane review,[279] which failed to demonstrate a preponderance of significant benefit over harm. Antidepressants have been investigated as a treatment for tinnitus, as the auditory cortex is rich in serotonin receptors, and there is a strong correlation between annoyance from tinnitus and the presence of depressive and/or anxiety disorders.[272,279,280] Although 6 of 9 trials of antidepressants for tinnitus showed significant improvement in several tinnitus measures, these trials had significant methodological limitations, heterogeneity in agents assessed as well as in inclusion and outcome measures, and lack of generalizability to patients without depression. The most recent Cochrane review included 4 trials of tricyclic antidepressants, 1 trial of trazodone, and 1 trial of a selective serotonin reuptake inhibitor (paroxetine).[279] Of these trials, four are double-blinded, 1 is singleblind, and 1 does not clearly state blinding.[279] All 4 tricyclic antidepressant trials included in the Cochrane review and 1 subsequent trials improvement of tinnitus, but the treatment effects may have been related to modulation of depressive and symptoms rather than.[279]

One trial comparing melatonin with sertraline found melatonin to be more efficacious and the confidence

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intervals on the sertraline results were wide.[114] Another trial exploring the effects of fluoxetine or fluoxetine with alprazolam[113] found no difference between the fluoxetine and combined therapy, results varied across measures assessed, and effect size of the findings of benefit were small to medium. Methodological concerns in these trials included dosing imprecision, failure to use validated tinnitus questionnaires, and small numbers of subjects.[113,114,270,272,281-283] Commonly reported side effects of antidepressants include sexual dysfunction, drowsiness, gastrointestinal distress, tremor, and dry mouth. Additional concerns are the potential increased risk of side effects when antidepressants are used with older adults.[284-286]

Anticonvulsants

Anticonvulsants are not recommended for treating tinnitus based on results from 8 RCTs and a Cochrane review that failed to demonstrate a preponderance of benefit over harm. Anticonvulsants potentially suppress central auditory hyperactivity that may be related to tinnitus. Anticonvulsants are believed to reduce tinnitus by augmenting the action or levels of neurotransmitters (gamma-aminobutyric acid [GABA], glutamate) or via the inhibition of cell depolarization by blocking voltage gated sodium channels.[287] None of the RCTs of anticonvulsants for tinnitus have shown a clear benefit. A recent Cochrane review of 7 placebo-controlled trials of anticonvulsants for chronic tinnitus found no improvement in tinnitus or health-related QOL.[287-293] A small, favorable effect of anticonvulsants was seen in this meta-analysis when measuring "any improvement" in self-assessment of tinnitus, but no effect was seen on near or total eradication of tinnitus annoyance.[287]

A randomized placebo-controlled trial of an 8-week treatment with gabapentin in an escalating dosing scale,[294] published subsequent to the Cochrane review, showed no differences between gabapentin and control groups when assessing the tinnitus severity index or loudness scores. A small subgroup of patients with hypertension, diabetes, or dyslipidemia showed a significantly better response to gabapentin than those without these comorbidities. A more recent review, however, further supported the lack of efficacy of gabapentin.[295] Of note, side effects of anticonvulsants reported during these RCTs were significant, most commonly nausea, dizziness, and headaches.[287,296,297]

Anxiolytics

Anxiolytics, such as benzodiazepines, should not be used to treat tinnitus because clinical trials do not consistently show benefit and they are associated with significant adverse effects. These include the potential for abuse, falls (particularly in the senior population), sedation, and physical dependence, the latter of which necessitates careful tapering when the medication is discontinued.[298] Additionally, data suggest the potential for long-term neuropsychiatric dysfunction, such as memory loss and anxiety, even after the medication is discontinued.[299] If used, dosing must be tailored and accomplished carefully, and response should be monitored.

A double-blind, placebo-controlled study of alprazolam showed decreased tinnitus loudness based on tinnitus matching as well as with a visual analogue scale.[276] However, another trial of alprazolam with a triple-blind randomized crossover design, using an active control, chlorpheniramine, to simulate the effect of drowsiness, did not find a significant difference in THI or tinnitus loudness but did find a significant improvement in a visual analog scale for tinnitus severity.[300] A single-blind randomized study of 66 patients treated with diazepam, flurazepam, oxazepam, clonazepam, and carbamazepine demonstrated improvement on a tinnitus visual analogue scale with oxazepam and clonazepam.[301] However, this study did not assess tinnitus loudness or use validated questionnaires, and subjects received more than 1 medication during the trial.

A systematic review accomplished by Jufas and Wood[302] assessed 6 clinical trials. They found that clozapine was effective in 3 studies but that these studies were limited by inadequate documentation of blinding. The other 3 agents assessed (alprazolam, diazapam, and oxazepam) were either contradictory or not effective. Overall, the findings suggested that the data were not robust and that side effects were a concern. Similarly, a network analysis accomplished by Li and colleagues[277] also did not support benefit from the use of benzodiazepines although this review incorporated a wide range of therapeutic agents.

Betahistine

Betahistine is a histamine analogue that increases blood flow to the inner ear and is used to treat vertiginous syndromes such as Ménière's disease.[303] However, it is also used for the treatment of tinnitus outside its use with Ménière's disease. A Cochrane review of betahistine for tinnitus found no benefit over placebo on tinnitus loudness or severity, with very low to moderate certainty evidence.[304] A recent triple-blind RCT likewise showed no clinically meaningful difference vs placebo on THI or secondary outcomes, and earlier controlled work found no consistent benefit.[305] Given its use for this purpose, several reviews have been accomplished to assess its effectiveness. These and other studies have found no benefit,[279] with the 2020 National Guideline Centre,[162] noting that it should not be used in the treatment of tinnitus alone.

Other Agents

Acamprosate, a medication that is used to treat alcohol dependence, regulates GABA- and glutamate-mediated neurotransmission. Three RCTs of this medication for

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treatment of tinnitus did show favorable results but had methodologic issues, and the evidence is insufficient to recommend such treatment.[273,306,307] Caroverine, a glutamate antagonist an antispasmodic noted to reduce nerve cell excitability has been used alone and in combination with Ginko biloba to treat tinnitus in countries outside the United States. Its use has been shown to have some beneficial effects with minimal side effects, but study samples were small and further data are needed. In the United States, Caroverine is currently not FDA approved for use outside an investigational setting.[308-312]

Intratympanic Medications

Intratympanic corticosteroid injections are not recommended for treating tinnitus based on available data. Intratympanic corticosteroid injections have been studied both as a single agent treatment (steroid alone) and in combination with forms of lidocaine. While data vary across studies, most suggest that, used alone, intratympanic corticosteroid injections are not effective. No RCTs exist that support intratympanic corticosteroid treatment for isolated persistent, bothersome tinnitus. Side effects of this treatment were seen in 2 studies performed without controls, including severe vertigo, nausea, and vomiting.[282,313]

Results from 3 prospective RCTs[37,274,314,315] do not support intratympanic steroids for treatment of tinnitus. Intratympanic dexamethasone injections and intratympanic methylprednisolone[274] produced no benefits over placebo saline injections when measuring subjective tinnitus severity scores. Another study randomized patients to intratympanic prednisone injection, intratympanic dexamethasone, and oral carbamazepine. Although no benefit for intratympanic steroids was seen over carbamazepine, absence of a placebo group prohibited further conclusions regarding treatment effect.[316] Another study of intratympanic dexamethasone also found no effect as compared to normal saline.[315] Side effects reported in these studies were minimal, most commonly vertigo, otalgia, and aggravation of tinnitus.

Intratympanic lidocaine injections are often used in combination with a steroid. Findings are mixed with some studies suggesting a benefit, but samples were small and the outcomes focused on the Tinnitus Handicap Index.[317-319] Few data are available on the use of lidocaine or lignocaine alone. One study comparing intratympanic dexamethasone with 4% lignocaine found both to be effective, but the dexamethasone was superior with fewer side effects.[317,320] A study of persons with refractory tinnitus found that intratympanic steroid was effective in low frequency tinnitus, whereas the steroid and lidocaine were effective in both low and high frequency tinnitus. However, the sample size of this study was small.

Statement 13: Dietary Supplements

Clinicians should not recommend dietary supplements for the primary indication of persistent, bothersome tinnitus.

Evidence Strength: *Recommendation against* based on RCTs and systematic reviews with methodological concerns, with a preponderance of benefit over harm.

Action Statement Profile: 13

- **Quality improvement opportunity:** To avoid use of commonly available supplements that have no proven efficacy and pose potential harm in the management of patients with tinnitus.
- **Aggregate evidence quality:** Grade C, based on RCTs and systematic reviews with extreme heterogeneity; most of the RCTs raise significant concerns regarding methodology and subject selection.
- **Level of confidence in the evidence:** High confidence regarding potential harm and adverse effects related to these agents, particularly in older adults; low confidence in benefits due to methodological concerns and study quality and ability to generalize results to patients with persistent, bothersome tinnitus not associated with a cause other than sensorineural hearing loss.
- **Benefits:** Avoid unproven therapy, side effects/adverse events (including tinnitus), and false hope; reduce expense; reduce risk of harm from use of unregulated products.
- **Risks, harms, costs:** None.
- **Benefit-harm assessment:** Preponderance of benefit over harm.
- **Value judgments:** Concern regarding the actual content and dosage of proposed active agents in these preparations, since they are currently packaged OTC. Many of these supplements, not under the regulations of the US Food and Drug Administration (FDA), have varying amounts of the "active" agent. The GUG was concerned over the widespread availability for easy purchase of these agents without consideration or knowledge of potential drug interactions and adverse events.
- **Intentional vagueness:** The term dietary supplements is used to represent nutritional and herbal supplements and homeopathic preparations promoted as remedies for tinnitus. Primary indication is used as the GUG did not want to discount the potential benefits of dietary supplements for other comorbid medical conditions.
- **Role of patient preferences:** Limited.
- **Exceptions:** Individuals for whom dietary supplements are clinically warranted for other reasons
- **Policy level:** Recommendation against.
- **Differences in opinion:** The majority of the GUG considered that harm clearly outweighed benefit,

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while a minority felt there was an overall balance between harm and benefit. The group agreed that melatonin may offer some potential benefit, particularly in managing sleep disturbance associated with tinnitus.
- **Changes from 2014 Guidelines**: The recommendations against Ginko biloba, zinc, or melatonin are no longer specified, and instead included in the more general term, "dietary supplements".
- **Implementation considerations:** None.

Supporting Text

The purpose of this statement is to highlight the lack of proven efficacy for use of dietary supplements for the primary indication of treating tinnitus, while highlighting available data for specific supplements balanced against their known side effects. Numerous supplements are reported by their manufacturers to benefit tinnitus and a significant number of patients use dietary supplements for the treatment of their tinnitus,[158] despite inconsistent or negative trial results and important safety/quality concerns. In 2018, over 57% of US adults took at least one dietary supplement daily and the rate of use appears to be increasing.[158,321] Of the dietary supplements studied for the management of tinnitus, the aggregate data are mostly for Ginkgo biloba, melatonin, vitamin B12, and zinc. This statement synthesizes evidence for these commonly used agents to guide counseling toward safer, evidence-based care.

Ginkgo biloba

Ginkgo biloba is commonly used for tinnitus. Two of its active ingredients, flavonoids and terpenoids, are associated with antiplatelet, antioxidant, antihypoxic, free-radical scavenging, and anti-edema properties, which have been purported to help reduce tinnitus through decreasing free-radical damage in the cochlea or improving blood flow and the overall health of the inner ear.[322,323] Randomized trials and systematic reviews do not support the use of ginkgo for tinnitus.[324-327] A recent Cochrane review found little to no effect versus placebo on tinnitus severity or tinnitus-related quality of life, with very low to low certainty due to small trials, heterogeneous preparations/doses, and inconsistent outcomes.[327] Trials using standardized extracts (eg, EGb 761, 120-240 mg/day for ~12 weeks) were predominantly negative on validated tinnitus outcomes (THI, visual analog scale (VAS) and product variability (flavonoid/terpenoid content) limits pooled inferences. Although RCT adverse events are generally similar to placebo, post-marketing data describe antiplatelet effects and bleeding risk, particularly with concurrent anticoagulants/antiplatelets; caution is warranted in at-risk patients, older individuals, and for patients undergoing surgical procedures. Ginkgo biloba should not be recommended as a treatment for tinnitus.[324-327]

Melatonin

Melatonin is a hormone secreted by the pineal gland that is involved in regulation of the sleep-wake cycle and supplementation may improve sleep quality. Melatonin, an antioxidant, may protect against ototoxic drugs and play a role in neural plasticity, apoptosis and autophagy, thus explaining its potential therapeutic effects in the ear.[328-330]

Evidence for the use of melatonin for tinnitus is mixed and of low certainty. Placebo-controlled RCTs and meta-analyses suggest at most small improvements in tinnitus outcome measures, with more consistent benefits for sleep outcomes. Several trials tested melatonin in combination with other active therapies, limiting attribution to melatonin alone.[114,278,331,332] Typical dosing is 3 mg nightly for 4 to 12 weeks; improvements correlate with sleep rather than tinnitus effects alone, such as tinnitus severity or frequency. Adverse events in trials are generally mild (eg, headache, dizziness). In the United States, melatonin products show wide variability in content (which may differ significantly from the labelled dose) and contamination (eg, serotonin, CBD), underscoring quality-control concerns and the need for counseling about third-party-verified products.[9,10] Melatonin should not be recommended solely for tinnitus. For tinnitus patients with comorbid insomnia, a time-limited, low-dose trial of melatonin may be considered to specifically address the sleep disturbance.

Vitamin B12

Across 3 randomized trials, vitamin B12 (cobalamin) does not show consistent benefit for the treatment of tinnitus. Improvements, when observed, were limited to participants with laboratory-confirmed vitamin B12 deficiency; no advantage was seen in unselected cohorts, and route of administration (oral vs intranasal) did not alter this pattern in a trial without placebo.[333-335] Therefore, vitamin B12 should not be recommended as a primary therapy for tinnitus; repletion should be reserved for patients with tinnitus and vitamin B12 deficiency confirmed by laboratory testing.

Zinc

Randomized evidence does not support the use of zinc for tinnitus. A Cochrane review of 3 small RCTs (n = 209 combined) found no improvement versus placebo, with heterogeneous dosing/outcomes and moderate–high risk of bias; a small single-center RCT reporting subjective improvement has not been replicated and has important limitations.[336] Zinc is generally well tolerated in the short term, but gastrointestinal adverse effects may occur, and

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BOX 1 Suggestions for Counseling Patients About Dietary Supplements for Tinnitus

1. Dietary supplements are readily available over the counter and are not approved or controlled by the US Food and Drug Administration.
2. No dietary supplement has been FDA-approved for the primary treatment of tinnitus, and none has been shown to cure tinnitus.
3. Dietary supplements may have side effects, especially when taken in high doses or when taken concurrently with pharmaceuticals or other supplements.
4. Patients with tinnitus should discuss the use of dietary supplements with their healthcare clinicians to maximize benefits and minimize side effects.
5. Melatonin may benefit patients with tinnitus via its effect on sleep disturbance.
6. Vitamin B12 may benefit patients with tinnitus and laboratory-documented vitamin B12 deficiency.
7. Ginkgo biloba can interact with other blood thinners to cause serious bleeding and can worsen bleeding risk in patients with underlying clotting disorders.
8. Zinc has no proven benefit for patients with tinnitus and causes harm in high doses.

chronic high-dose use can cause copper-deficiency myeloneuropathy. Routine zinc supplementation should not be recommended for tinnitus.

Patient Counseling (Box 2)

Patients often conflate marketing claims with scientific evidence and both clinicians and patients should understand that "over-the-counter" does not always mean "risk-free." Clinicians should explain that no supplement has FDA approval for or has been proven to cure tinnitus. Clinicians should also counsel patients about potential harm from OTC supplements: that US products vary widely in dosage of the active ingredients and often contain a multiplicity of "inactive" or unwanted ingredients; that ginkgo may increase bleeding risk; that melatonin targets sleep disturbance, not primarily tinnitus; that vitamin B12 is only helpful for patients with tinnitus and vitamin B12 deficiency, but not tinnitus with normal vitamin B12 levels; that zinc lacks benefit and can cause harm at high doses. Shared decision-making should emphasize evidence-based tinnitus care and careful review of all OTC products for potential side effects and interactions with a patient's medications (**Box 1**).

Statement 14A: Neuromodulation

14A. Repetitive Transcranial Magnetic Stimulation (rTMS) Clinicians should not recommend rTMS for the treatment of patients with persistent, bothersome tinnitus.

Evidence Strength: *Recommendation against based on inconclusive RCTs.*

Action Statement Profile: 14

- **Quality improvement opportunity:** To avoid use of a therapy that has inconclusive efficacy, is inaccessible to many patients, and poses potential financial harm in the management of patients with tinnitus.
- **Aggregate evidence quality**: Grade B, based on inconclusive RCTs and systematic reviews.
- **Level of confidence in the evidence:** High regarding the absence of a long-term (>6 months) benefit of rTMS; moderate regarding the absence of a short-term benefit, since numerous trials demonstrated transient beneficial outcomes, though of unclear clinical significance, and strength of this evidence is low.
- **Benefits:** Avoid unproven therapy, side effects/adverse events, and false hope; reduce expense.
- **Risks, harms, costs:** Denying some patients potential benefit.
- **Benefit-harm assessment:** Preponderance of benefits.
- **Value judgments:** None.
- **Intentional vagueness:** None.
- **Role of patient preferences:** Limited.
- **Exceptions:** Patients with refractory major depression or other psychiatric or neurological conditions for which rTMS is indicated.
- **Policy level:** Recommendation against.
- **Differences in opinion:** None.
- **Changes from 2014 guidelin**e: None to key action statement, supporting text and evidence is updated.
- **Implementation considerations:** None.

Supporting Text

The purpose of this statement is to avoid the routine use of repetitive transcranial magnetic stimulation (rTMS) for the treatment of tinnitus. rTMS is considered a form of neuromodulation, a category of interventions that can suppress or enhance neural activity, depending on the frequency and location of stimulation. Neuromodulation for tinnitus refers to the use of techniques that alter neural activity in specific brain regions to reduce tinnitus perception and distress. This can be achieved through both invasive and noninvasive methods, but in the context of tinnitus, noninvasive brain stimulation (NIBS) is most commonly studied and applied.[337,338]

NIBS encompasses several modalities, including rTMS, transcranial direct current stimulation (tDCS), and transcranial random noise stimulation (tRNS). These techniques modulate cortical excitability and neural network activity without surgery.[337] rTMS has

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BOX 2 Benefits of Tinnitus Follow-up

1. Patients can be offered reassurance, ongoing support, and validation of their lived experiences and struggles with tinnitus.
2. The effectiveness of interventions can be assessed through surveillance.
3. Care may be modified to meet individual needs if measured outcomes worsen or new concerns are identified.
4. Clinicians can compare outcomes to those peers and published data to facilitate practice improvement.
5. Opportunities for quality improvement may be discovered.

the most evidence for tinnitus management among NIBS techniques, synthesized in multiple systematic reviews and meta-analyses. As a result, this key action statement will focus on discussion of the evidence for and against routine use of rTMS for the treatment of tinnitus.

Transcranial magnetic stimulation (TMS) is a noninvasive neuromodulation technique that uses rapidly changing magnetic fields, delivered via a coil placed on the scalp, to induce electric currents in targeted cortical regions. It is FDA-approved for treatment of refractory major depressive disorder, obsessive-compulsive disorder, and as an aid for smoking cessation; use for tinnitus is considered investigational. In the context of tinnitus, repetitive TMS (rTMS) is most commonly applied as low-frequency (typically 1 Hz) stimulation over the auditory cortex or temporoparietal junction, with the goal of reducing cortical hyperactivity thought to underlie the perception of tinnitus.[339] Clinically, rTMS protocols for tinnitus often involve daily sessions over 1 to 2 weeks, with each session delivering several hundred to several thousand pulses. Some studies have also explored high-frequency stimulation of prefrontal regions or sequential/multisite protocols targeting both auditory and prefrontal cortices.[340-342] The most consistent, though modest, short-term benefit has been observed with low-frequency rTMS over the temporoparietal junction (midway between T3/P3 or T4/P4),[343] but effects are variable and often not sustained beyond several weeks to months. The mechanism is hypothesized to involve modulation of maladaptive cortical plasticity and network connectivity associated with tinnitus perception and distress. Adverse effects are generally mild and transient, such as scalp discomfort or headache, with no significant safety concerns reported in the short-term, though long-term studies have not been performed.[344-346]

While rTMS is scientifically plausible and has demonstrated some short-term efficacy in reducing tinnitus severity in select patients, the clinical benefit is inconsistent and not reliably durable, and there is no consensus on optimal stimulation parameters or patient selection.[347,348] Recent meta-analyses, systemic reviews, and randomized controlled trials have further characterized the efficacy and limitations of rTMS for tinnitus treatment.[310,346-353] These analyses typically included between 5 and 29 RCTs, with sample sizes ranging from several hundred to over a thousand patients. Most reviews stratified results by short-term (1 week to 1 month), medium-term (2-3 months), and long-term (6 months) follow-up. The majority of studies used low-frequency (1 Hz) rTMS protocols targeting the auditory cortex or temporoparietal junction, though some included high-frequency or prefrontal stimulation protocols. Most analyses included randomized, sham-controlled study designs, use of standardized, validated outcome measures such as Tinnitus Handicap Inventory (THI) and Tinnitus Questionnaire (TQ), meta-analytic pooling of data, safety analyses, as well as subgroup analyses. Patient demographics were generally consistent across studies, with mean ages in the late 40 s to early 50 s, a predominance of male participants, and a majority presenting with unilateral tinnitus. The mean duration of tinnitus was typically around 3 to 4 years, though individual studies included a range from several months to over a decade.[344] Most trials focused on adults with subjective, nonpulsatile tinnitus, and excluded those with significant psychiatric comorbidity or unstable medical conditions.

The meta-analyses consistently found that rTMS produced small but statistically significant improvements in THI scores compared to sham at 1 week, 1 month, and up to 6 months, with mean differences in the range of 6 to 8 points, but these changes often did not reach thresholds for clinical significance and were not consistently observed across all outcome measures or time points.[348] Effects on TQ and visual analogue scale (VAS) scores were less robust, with several analyses reporting no significant benefit over sham. Subgroup analyses sometimes suggested greater benefit with auditory cortex targeting or in specific patient subgroups, but heterogeneity in stimulation parameters and outcome reporting limited definitive conclusions. Unresolved issues across most studies persist, reducing generalizability of recommendations. Folmer highlighted key standardization issues in TMS research such as brand of TMS system and its configuration; coil type, orientation, and placement method; scalp or neural target; laterality of rTMS application; dual site vs. single site stimulation; stimulation frequency and intensity; number of sessions; number of pulses per session; determination of the resting motor threshold (rMT) among more typical clinical trial challenges such as standardized endpoint, long-term follow-up timeframes, and broadened demographics investigations.[354]

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In summary, the evidence supporting rTMS for treatment of tinnitus is mixed, with modest, short-term benefits in select patients but no proven long-term efficacy; larger, multisite clinical trials are needed to standardize treatment protocols and clarify long-term efficacy. In addition to mixed efficacy, rTMS poses significant financial and access burdens. The cost of rTMS for tinnitus treatment in the United States is highly variable and not well-described, but generally accepted to be cost-prohibitive to most patients due to lack of insurance coverage, time-intensive considering typically multiple sessions are required, and difficult to access as it is not widely available. Given mixed evidence of efficacy, limited access, and financial burden, rTMS should not be recommended as routine treatment for chronic tinnitus, and further research is needed to clarify optimal protocols and patient selection.

Statement 14B: Bimodal Stimulation

14B. Clinicians may offer bimodal neuromodulation to patients with persistent bothersome tinnitus

Evidence Strength: *Option* based on a limited number of randomized controlled trials with a preponderance of benefits over harms.

Action Statement Profile: 14B

- **Quality improvement opportunity:** Introduce clinicians to a new FDA-approved treatment modality with favorable results in initial trials.
- **Aggregate Evidence Quality:** B.
- **Level of confidence in evidence:** Medium, as trials were industry-sponsored and long-term outcomes are not available.
- **Benefits:** Improve the impact of tinnitus with an FDA-approved modality.
- **Risk, Harm, Cost:** Cost and time of treatment, non-improvement or worsening of tinnitus symptoms.
- **Benefit-Harm Assessment:** Balance of Benefits and Harms.
- **Value Judgments:** None.
- **Intentional Vagueness:** None.
- **Role Of Patient Preferences:** Large.
- **Exceptions:** Patients who do not have moderate to severe tinnitus as defined in the trials that led to FDA approval.
- **Policy Level:** Option.
- **Differences of Opinion:** The GUG had considerable concern about sponsorship of RCTs by industry that created the device. 10 panelists favored a KAS, 7 felt it was premature to have a KAS because of these concerns about evidence and 2 abstained. There were additional concerns about the quality of study design methodology. The chair of GUG was recused from discussions and voting because of a potential professional conflict of interest.
- **Changes from 2014 Guidelines**: This is a new key action statement.
- **Implementation Considerations:** Limited availability of treatment centers.

Supporting Text

The purpose of this statement is to inform clinicians about the role of neuromodulation with bimodal stimulation as an option for management of persistent, bothersome tinnitus. Neuromodulation techniques attempt to decrease tinnitus percepts and effects by enhancing plasticity within the auditory pathway, thus decreasing pathologic neuronal activity that leads to bothersome tinnitus. Bimodal stimulation techniques, which are a subset of neuromodulation, pair auditory stimulation with somatosensory input to induce plasticity and reduce tinnitus perception and effects. In clinical studies, auditory stimulation has been coupled with stimulation of the face or neck region, tongue, or vagus nerve.[355-357] Recently, the FDA authorized a bimodal neuromodulation device that couples auditory stimulation with simultaneous tongue stimulation following completion of 3 industry-sponsored, prospective, randomized clinical trials. The FDA authorized the device (2023) primarily on the multi-site study TENT-A3, which used a within-participant sequence of 6 weeks of sound-only followed by 6 weeks of bimodal therapy.[356] The primary outcome was THI, with an MCID of 7 points. In the overall cohort, 63.3% achieved a ≥7-point THI reduction during the sound-only phase; with the addition of tongue stimulation, a further 43.3% achieved an additional ≥7-point reduction over the next 6 weeks. Among patients at least moderately affected by their tinnitus at the start of bimodal therapy (THI ≥ 38), the 6-week responder rate was 58.6% with bimodal versus 43.2% with sound-only ($P = .022$). Across the full 12-week course, 79.4% met the THI responder threshold overall (76.0% for THI ≥ 38). No device-related serious adverse events were reported; most adverse events were mild. Durability beyond the treatment period was not assessed in TENT-A3.

Two earlier randomized trials without sham control provide complementary magnitude and durability data. TENT-A1 reported mean THI/TFI improvements of approximately 12 to 13 points over 12 weeks, with effects maintained to 12 months.[358] TENT-A2 reported larger average long-term reductions (THI − 20.2; TFI − 17.3 at 12 months) when stimulus parameters were adjusted during treatment, with high adherence and no differences between parameter arms.[359]

Taken together, these industry-sponsored randomized studies suggest that bimodal neuromodulation may provide clinically meaningful improvements in tinnitus severity in a substantial subset of appropriately selected patients, with durability to 12 months (beyond the treatment period) shown in nonpivotal trials. Important

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limitations include industry sponsorship (ie, lack of independent replication), absence of a sham control in the pivotal study, and reliance on responder thresholds. Other long-term impacts of stimulation are not known. Clinicians may offer bimodal neuromodulation to suitable candidates while setting and measuring objective goals (eg, change in THI), discussing costs and adherence, and acknowledging uncertainty about long-term effectiveness and cost-effectiveness.

The GUG considered other forms of neuromodulation that have been studied for tinnitus, including vagus nerve stimulation, tDCS, deep brain stimulation, and photobiomodulation. There was insufficient evidence to support recommendations and/or the treatments remain investigational and were not FDA approved for tinnitus.

Statement 15: Follow-up/Outcomes

Clinicians or their designee should assess and document outcomes of interventions in patients with persistent, bothersome tinnitus.

Evidence strength: *Recommendation* based on observational studies with a preponderance of benefit over harm.

Action Statement Profile: 1

- **Quality improvement opportunity:** Provide follow-up to assess results of interventions, the need to try other interventions, and to identify worsening symptoms; facilitate tracking of outcomes to determine effective treatments and inform practice improvement.
- **Aggregate Evidence Quality:** B, randomized controlled trials of a variety of interventions for treatment of tinnitus.
- **Benefits:** Understand natural history as well as benefits of interventions for tinnitus, identify factors leading to treatment cessation or change, allow access to new treatments.
- **Risk, Harm, Cost:** Time and expense of follow-up.
- **Benefit-Harm Assessment:** Preponderance of Benefit over harm.
- **Level of confidence in evidence:** Medium.
- **Value Judgments:** GUG felt that many patients may not be followed long-term after initial evaluation or start of intervention/treatment.
- **Intentional Vagueness:** Duration and frequency and methods of follow-up inquiry are not specified.
- **Role Of Patient Preferences:** Large; as patients may decide how often and how long they want to be evaluated.
- **Exceptions:** None.
- **Policy Level:** Recommendation
- **Differences of Opinion:** None.
- **Changes from 2014 Guidelines**: This is a new key action statement.
- **Implementation Considerations:** Choice of best methods for outcomes assessment and follow-up, especially if resources are limited.

Supporting Text

The purpose of this statement is to encourage clinicians to follow-up, assess, and document outcomes for patients with persistent, bothersome tinnitus. Follow-up for patients with tinnitus allows both the clinician and the patient to measure the impact of tinnitus over time, as well as to continue educating, counseling, providing care, and reassessing throughout the patient's tinnitus journey (**Box 2**).[16] The clinician offering the tinnitus intervention may be the best clinician to follow-up with the patient for continuity of care and outcome measurement, but a designee may be assigned based on patient preference or practical considerations.

A variety of outcome measures for tinnitus are available for clinical and research use, and no one tool is universally considered best for all patients or contexts. Validated tinnitus assessment tools are presented in **Table 10** (KAS 2). An improvement of 15% compared to baseline scores may be considered clinically meaningful.[360] However, there is a lack of consensus on how much of a change on an outcomes instrument is needed for an individual to report clinically meaningful improvement in tinnitus and values may vary based on the duration of treatment, treatment provided, and differences among patients with no past tinnitus treatment and patients with past failed treatments. To capture important subjective experiences related to tinnitus, additional useful outcomes may include perceived changes in tinnitus loudness, tinnitus concentration, tinnitus acceptance, as well as quality of life, quality of sleep, and coping mechanisms. Rademaker et al and Sherlock et al,[4,361] discourage the use of psychoacoustic measurements (eg, minimum masking level, pitch, or loudness matching) since they do not offer benefit in assessing treatment response. No single or bundle of measurement tools may be able to capture what matters most to the patient. Clinicians are encouraged to mutually define with the patient what outcomes both are seeking to achieve through the intervention offered to guide their decisions of when or what is considered the end point of the intervention and future follow-ups.[220,362]

Common factors that predict risk of acute tinnitus transitioning to chronic include severe tinnitus distress level, psychological distress, history of mental disorder, somatization, insomnia, poor coping mechanisms, and impact on physical activity.[363] Such characteristics may be identified during follow-up visits and should be appropriately managed to reduce the risk of transitioning to chronic tinnitus.[62,364,365]

The optimal interval, duration, and modalities for follow-up are yet to be defined and need to be considered on a case-by-case basis.[366] While clinical studies typically

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conduct pretreatment testing followed by 3, 6, or up to 12 months of retesting, this varies widely based on interventions used and follow-up duration may be limited due to cost constraints. Additionally, tinnitus patients may benefit from outcomes assessment and long-term follow-up even outside of a clinical trial. The time horizon to observe improvements in tinnitus may differ based on tinnitus severity. For example, when mild to moderate tinnitus patients reported improvements in scores, the longer these patients were in treatment, the more their scores improved, whereas patients with severe tinnitus may require even longer duration of treatment to note clinical improvements in tinnitus and scores.[362,367] Follow-up may occur via several modalities, as it is unknown if there are differences in benefit between in-person visits, telehealth visits, or telephone contact. There is insufficient evidence to recommend purely electronic-based management or follow-ups at this time. Frequent visits add additional cost and time burdens on patients and clinicians.[32] Therefore, clinicians should engage patients in shared decision-making on setting follow-up intervals and endpoints.

Implementation Considerations

This clinical practice guideline update is published as a supplement to *Otolaryngology–Head and Neck Surgery* to facilitate reference and distribution. An executive summary of the recommendations is also being published to more concisely present the KASs to clinicians. A full-text version of the guideline will be accessible, free of charge, at http://www.entnet.org/tinnitus-update. The guideline will be presented to AAO-HNS members as a Panel Presentation at the AAO-HNSF 2026 Annual Meeting & OTO EXPO. Existing website content, brochures, and publications by the AAO-HNSF will be updated to reflect the guideline's recommendations. Podcasts will be developed to introduce the recommendations of this guideline to target clinicians. A plain language summary is available to help patients with persistent, bothersome tinnitus navigate the recommendations of this guideline, with emphasis on avoiding unproven and potentially harmful tinnitus treatments. Additionally, relevant education materials are developed in collaboration with GUG's patient advocate and are accessible on the webpage.

Barriers to implementation identified by the GUG included limitations in access to specific types of assessment and care (eg, access to health professionals trained in sound enrichment or CBT, access to potential therapies such as bimodal stimulation), potential limitations or burden of administering validated outcome measures, differing payer coverages and limitations, and educational needs regarding the pathophysiology, diagnosis, and management of tinnitus. In particular, the GUG discussed the cost and availability of recommended interventions, such as hearing aid evaluation, sound enrichment, cognitive behavioral therapies, and bimodal stimulation. These treatments are often excluded from traditional medical insurance coverage, and specialists who can evaluate and recommend these treatments for tinnitus may not be available to the large number of persons with persistent, bothersome tinnitus.

The GUG agreed that a few action statements are likely to generate significant discussion among clinicians. First, although the group agreed on the importance of inquiring about somatosensory tinnitus, the group understands that a future need is a better definition of this clinical entity and its management. Second, the group recognized the wide use of a variety of medications for tinnitus, as well as many dietary supplements for tinnitus. The quality of available evidence, however, did not support the use of such medications for the primary indication of tinnitus. Suggestions for future study of these agents for tinnitus, with strict methodology, are detailed in the next section. Third, the group determined that the level of evidence is sufficient for bimodal stimulation to be offered for patients with persistent, bothersome tinnitus. The group expressed concern, however, that the data were primarily industry-sponsored. This has been identified as a future research need in the next section.

Implementation of the proposed recommendations contained in the guideline will benefit from additional written and online resources, ideally integrated within clinical electronic systems, decision support tools, and other intelligent tools that support practice. Performance measures may also be derived from guideline recommendation statements.

In addition, we have developed a flow chart (**Figure 1**) to help clinicians understand the key decisions for evaluation and management of tinnitus as well as to demonstrate the appropriate target patients for the recommendations of this CPG.

Research Needs

This guideline was developed based on the current body of evidence regarding tinnitus in adults as determined by the GUG's review of the literature, assessment of current clinical practices, and determination of evidence gaps. While numerous interventions have been studied, limitations in trial design, variability in assessment methods and heterogenous patient populations continue to challenge interpretation and generalization of results. Clinical trials of interventions for tinnitus should incorporate (1) well-defined inclusion criteria with clear characterization of tinnitus features, duration and severity of tinnitus, comorbidities and prior interventions, (2) validated and responsive outcome measures, (3) both short- and long-term follow-up, (4) rigorous study design-including appropriate controls, randomization, and blinding (when clinically appropriate and ethical), (5) adequate sample size; and (6) recruitment of participants who reflect the diversity of the tinnitus population to ensure broad generalizability of results.

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The GUG identified additional needs for future research, as follows:

1. Define the natural history of tinnitus and establish clear criteria for acute versus chronic tinnitus.
2. Assess the significance of progression vs. stability of tinnitus features and identify clinical features that predict prognosis to guide patient counseling and referral timing.
3. Include a broader, more representative population of adults in terms of age, sex, race, ethnicity, socioeconomic status, and language in clinical outcomes research, and validate outcome measures across cultural and linguistic groups.
4. Assess the economic burden of tinnitus, including direct and indirect costs prior to meaningful benefit, and apply economic models to understand treatment demand and cost benefit relationships.
5. (KAS 1) Characterize and validate tinnitus phenotypes that may influence presentation, tinnitus impact, and variations in treatment response.
6. (KAS 1) Identify reliable objective measures of tinnitus, including functional imaging and biomarkers.
7. (KAS 1) Address access to care issues, including rates of referral to otolaryngologists, audiologists, and mental health professionals, trends in referral patterns, and strategies to improve timely access to specialized care, and determine if outcomes including time to tinnitus improvement vary by initial clinician.
8. (KAS 1) Investigate the relationship between sleep quality, sleep apnea severity and management, and tinnitus severity.
9. (KAS 1) Clarify through epidemiologic research the relationship between tinnitus and comorbidities such as hearing loss, hyperacusis, misophonia, migraine, depression, and anxiety, with attention to patterns that may influence management.
10. (KAS 2) Identify best practices for clinically assessing both the perception of and reaction to tinnitus, including the validity, responsiveness, and comparative utility of various instruments; determine which tools are most effective for specific patient features or time points and which best capture changes in tinnitus severity, psychological distress, and quality of life.
11. (KAS 2) Evaluate the social impact of tinnitus, including effects on family, friends, and social functioning.
12. (KAS 3) Develop and validate measures to assess risk of self-harm in patients with tinnitus. Studies should identify specific red flag features associated with self-harm and determine whether changes in standard tinnitus outcome measures correlate with psychological distress or risk profile.
13. (KAS 4) Expand on research of somatosensory tinnitus to define diagnostic criteria, expected clinical course, and optimal management strategies. Studies should evaluate interventions such as physical therapy, oral and maxillofacial or dental procedures, and rehabilitation approaches, using validated tools. Epidemiologic studies should document incidence, referral patterns, and the consequences of delayed diagnosis.
14. (KAS 5) Evaluate the optimal timing and content of audiologic assessments for tinnitus. This should include assessing the utility of high-frequency audiometry and other means of detecting auditory injury or dysfunction that may be missed on conventional testing, identification of features of concern, as well as analyses of cost-effectiveness and accessibility across care settings.
15. (KAS 5) Assess the use and accuracy of readily available hearing screening applications, including their role in identifying hearing loss and pitch matching among patients with tinnitus.
16. (KAS 6) Clarify when imaging is indicated for patients with persistent, bothersome tinnitus and what modalities provide the highest diagnostic yield for specific clinical scenarios, including cost-benefit analyses.
17. (KAS 7) Gather more evidence to understand what tinnitus patients most want addressed during education and counseling, which education and counseling features have the greatest impact, and how education and counseling can be tailored to individual needs. This should include consideration of both tinnitus-specific concerns and broader quality of life issues.
18. (KAS 8) Conduct comparative research on the effect of OTC hearing aids versus audiologist-fitted devices on tinnitus outcomes for those with hearing difficulties.
19. (KAS 8, 9, 10) Determine the impact of hearing amplification devices, including traditional hearing aids, bone-anchored hearing aids, cochlear implants, and auditory brainstem implants on tinnitus severity and the feasibility and efficacy of delivering sound enrichment through these devices.
20. (KAS 10) Conduct additional investigations to examine outcomes of generic and proprietary sound enrichment, such as notched sound or music, in improving tinnitus severity and quality of life.
21. (KAS 10) Conduct comparative evaluations of sound enrichment via self-management versus clinician supported.

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22. (KAS 11) Execute comparative effectiveness studies to examine different behavioral therapeutic approaches and support strategies, including CBT for tinnitus alone versus for tinnitus with comorbid anxiety or depression, as well as acceptance and commitment therapy and mindfulness-based approaches.
23. (KAS 10/11) Determine efficacy of E-Health approaches—app-based, smartphone, and web-based programs for tinnitus.
24. (KAS 12) Evaluate the efficacy, safety, and risk profile of inner ear therapies including stem cell therapy for tinnitus.
25. (KAS 13) Identify quality evidence for the effects, risks, indications (eg, Vit B12 serum levels) and benefits of dietary supplements commonly used by tinnitus patients.
26. (KAS 14A) Study long-term outcomes of rTMS, including variations in target region, duration, and frequency of treatment, and combination with other therapies. The influence of conditions comorbid with tinnitus, such as depressive disorders, on dosing protocols and outcomes should be assessed.
27. (KAS 14) Complete further research on the long-term outcomes, safety, efficacy, and optimal clinical setting of other neuromodulation devices, such as transcutaneous direct current stimulation, ultrasound, deep brain stimulation, vagus nerve stimulation, Desyncra, low-level laser therapy, and bimodal stimulation.
28. (KAS 14B) Independently study (and replicate) the long-term and real-world efficacy of bimodal stimulation devices.
29. (KAS 14B) Independently quantify the effect of the addition of tongue stimulation during bimodal neuromodulation compared to the effect of the acoustic stimulation alone.
30. (KAS 14) Perform randomized trials to compare neuromodulation to other therapies (eg, CBT).
31. (KAS 15) Determine best practices for long-term follow-up of tinnitus patients. Studies should identify optimal follow-up intervals, the role of repeat audiograms, criteria for discharge from follow-up, and the usefulness of subjective and objective measures in ongoing monitoring.

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Disclaimer

The clinical practice guideline is provided for information and educational purposes only. It is not intended as a sole source of guidance in managing adults with tinnitus. Rather, it is designed to assist clinicians by providing an evidence-based framework for decision-making strategies. The guideline is not intended to replace clinical judgment or establish a protocol for all individuals with this condition and may not provide the only appropriate approach to diagnosing and managing this program of care. As medical knowledge expands and technology advances, clinical indicators and guidelines are promoted as conditional and provisional proposals of what is recommended under specific conditions but are not absolute. Guidelines are not mandates; these do not and should not purport to be a legal standard of care. The responsible physician, in light of all circumstances presented by the individual patient, must determine the appropriate treatment. Adherence to these guidelines will not ensure successful patient outcomes in every situation. The AAO-HNSF emphasizes that these clinical guidelines should not be deemed to include all proper treatment decisions or methods of care, or to exclude other treatment decisions or methods of care reasonably directed to obtaining the same results.

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