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Clinical Practice Guideline for Management of Tinnitus
Recommendations From the US VA/DOD Clinical Practice Guideline Work Group

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IMPORTANCE The most recent US clinical practice guideline (CPG) for tinnitus was published in 2014. The US Department of Veterans Affairs (VA)/US Department of Defense Tinnitus Clinical Practice Guideline Work Group recently completed a new guideline. The work group consisted of experts across disciplines who were supported by the VA Office of Quality and Patient Safety and the Defense Health Agency Clinical Quality Improvement Program. This article summarizes the first VA/US Department of Defense CPG for tinnitus management.

METHODS AND OBSERVATIONS The guideline was based on a systematic review of clinical and epidemiological evidence. Rigorous methods determined the strength of the recommendations. Developed by a panel of multidisciplinary experts, it provides a clear explanation of the logical associations between various care options and health outcomes while rating the quality of the evidence and strength of the recommendations for 20 questions focused on evaluating and managing care for adults with bothersome tinnitus. The guideline provides an evidence-based framework for evaluating and managing care for adults with bothersome tinnitus.

CONCLUSIONS AND RELEVANCE The CPG offers patients with tinnitus and clinicians an overview of evidence-based education and self-management, care options, and recommended outcome measures to monitor effectiveness and potentially improve patient health and well-being. Findings of a lack of sufficient evidence resulted from evaluating the quality of the body of evidence and emphasize the gaps in knowledge that need further study. Addressing these gaps may enable a comprehensive evaluation of the potential benefits and limitations of various tinnitus care options, ultimately improving patient care and clinical practice.

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Tinnitus is the perception of sound that does not have an external source. It can be constant or intermittent and perceived as ringing, buzzing, or other sounds.[1,2] The subjective symptom of chronic tinnitus (ie, tinnitus lasting longer than 6 months) is experienced by millions of people worldwide.[3] An estimated 50 million adults in the US experience tinnitus.[4] Most people with tinnitus are not bothered by it. For those who are, tinnitus severity is associated with insomnia, depression, anxiety, and poorer quality of life (QoL).[5] Any condition or exposure that injures or damages the auditory system can contribute to the generation of subjective tinnitus, such as presbycusis (hearing loss caused by aging), prolonged exposure to loud sounds (noise-induced hearing loss), acoustic trauma (brief exposures to very high-intensity sounds), and injuries and diseases that affect the brain and auditory system.[6]

Tinnitus is of particular interest to the US Department of Veterans Affairs (VA) and the US Department of Defense (DOD) because it is the most prevalent service-connected disability among veterans, with nearly 3 million individuals receiving compensation for the condition.[7] Tinnitus and hearing loss in veterans and service members are sometimes associated with military noise (eg, gunfire, military vehicles); chemical (eg, solvents) exposures; otoacoustic trauma caused by bombs and blast exposure; traumatic brain injury (TBI); physical injuries, such as head or neck trauma; and structural damage to the auditory system (eg, perforated tympanic membranes).[8,9] Tinnitus and hearing loss acquired during military service might be exacerbated by subsequent exposure to nonmilitary risk factors (eg, recreational gunfire, power tools, machinery, and music). Tinnitus is usually irreversible, so affected service members and veterans might face a lifetime of clinical care to manage problems associated with tinnitus.

This clinical practice guideline (CPG)[10] was developed by a team of interdisciplinary subject matter experts, with support from the

Office of Quality and Patient Safety, Veterans Health Administration, and the Clinical Quality Improvement Program, Defense Health Agency. Development of this first VA/DOD CPG for tinnitus was partially motivated by the fact that the most recent CPG developed in the US was completed 10 years ago.[11]

Methods

The VA and DOD Evidence-Based Practice Work Group initiated the first VA/DOD CPG for tinnitus. This new CPG was developed using standards and methods that were implemented previously for 23 other VA/DOD CPGs[12] and is based on a systematic review of clinical and epidemiological evidence that provides an evidence-based framework for evaluating and managing care for adults with bothersome tinnitus. The methods followed the Guideline for Guidelines[13] and aligned with the National Academy of Medicine's principles of trustworthy CPGs (eg, explanation of evidence quality and strength, management of potential conflicts of interest, interdisciplinary stakeholder involvement, use of systematic reviews, and external review of the final guideline). Full details regarding the guideline development process are described in the eMethods in the Supplement. This article summarizes the tinnitus CPG, which was published online in 2024.[10] The complete CPG and supporting materials (including a patient summary, provider summary, and reference card) can be accessed online.[10] Within the complete work group (WG), the systematic review process is thoroughly described, including the methods for grading the quality of the evidence, using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach.[14-16] To guide this CPG's systematic evidence review, the WG drafted 20 questions on clinical topics of the highest priority for the VA and DOD populations. The questions followed the population, intervention, comparison, outcome, timing, and setting framework.

The strength of a recommendation was defined as the extent to which one can be confident that the desirable effects of an intervention outweigh its undesirable effects (**Table**). The relative strength of each recommendation was based on 4 domains: (1) confidence in the quality of the evidence; (2) balance of desirable and undesirable outcomes; (3) patient values and preferences; and (4) other considerations, such as resource use, equity, acceptability, feasibility, and subgroup considerations. A given recommendation's strength (ie, strong vs weak) was distinct from its clinical importance (eg, a weak recommendation was evidence based and still important to clinical care). This CPG's use of GRADE reflected a more rigorous application of the methods than previous iterations; the determination of the strength of the recommendation was more directly associated with the confidence in the quality of the evidence on outcomes that are critical to clinical decision-making.[14-16]

Recommendations

Monitoring (Recommendations 1-2)

The WG suggested using validated subjective outcome measures (eg, Tinnitus Functional Index) to monitor the effectiveness of tinnitus management. Evidence suggests that self-report measures are efficient in assessing tinnitus severity and responsiveness to treatment-related changes.[17-21] Conversely, psychoacoustic measurements (eg, minimum masking level, pitch, or loudness matching) are not responsive to treatment changes and should not be used to monitor tinnitus intervention outcomes.[21]

Education and Self-Management (Recommendations 3-5)

The WG suggested educational counseling to reduce the functional impact of tinnitus. Evidence from a single randomized clinical trial (RCT) included in a systematic review (SR)[22] supports educational counseling by an audiologist. The CPG patient focus group indicated that their initial lack of understanding and knowledge about tinnitus might have delayed their care, reinforcing the value of early educational counseling.

Mobile applications (apps) provide an additional modality for accessing self-management tools, but evidence from a single RCT[23] was insufficient to make a recommendation for or against web-based or app-based self-management tools for tinnitus. Readily available products include sound libraries, guided relaxation and wellness exercises, sleep hygiene guidance, and various combinations of sound and stress-reduction guidance. However, RCTs supporting the efficacy of web-based and app-based technology without direct clinician involvement are lacking. Despite the limited evidence of benefit, the WG determined there is little or no harm in educating patients of the availability of web-based or app-based self-management tools.

The WG determined that there is insufficient evidence to recommend for or against the use of computer-based games and training programs for tinnitus self-care. Prototype computer-based games that focus on auditory training by using sound in various active perceptual training paradigms (eg, frequency discrimination training, auditory cognitive training, and auditory attention training) are available. The WG's confidence in the quality of the evidence, limited to 3 RCTs, was very low due to small sample size and poor study quality.

Amplification Devices (Recommendations 6-10)

The WG suggests hearing aids for adults with hearing loss and cochlear implants for adults who meet candidacy requirements. The WG suggests cochlear implants vs implantable bone conduction devices (BCDs) or contralateral routing of signal/sound (CROS) hearing aids for tinnitus management in adults with single-sided deafness (SSD) who meet candidacy requirements.

Evidence suggests that hearing aids are associated with a reduced functional impact of tinnitus.[24,25] Despite the low confidence in the quality of the evidence regarding sample size, risk of bias, and heterogeneity, the benefits of hearing aids outweighed the potential harms. This conclusion was reinforced by the patient focus group, which emphasized that hearing aids were associated with a reduced functional impact of tinnitus.

Surgical indications for cochlear implants have evolved and expanded in recent years to include patients with less severe hearing loss and those with SSD. Evidence from recent SRs and RCTs, largely derived from studies evaluating patients with SSD, suggests that cochlear implantation is effective at reducing self-perceived tinnitus handicap in adults who meet candidacy requirements.[26-32] The confidence in the quality of the evidence was low. Overall, the evidence showed durable improvement in tinnitus outcomes following cochlear implantation for participants with SSD compared with those who did not undergo cochlear implantation.[27-29]

Although not included in the systematic evidence review nor associated with the strength of the recommendation, an SR con-

Table. Recommendations

Topic	No.	Recommendation	Strength
Monitoring	1	We suggest using validated subjective outcome measures (eg, Tinnitus Functional Index, Tinnitus Handicap Inventory) to monitor the effectiveness of tinnitus management.	Weak for
	2	We suggest against psychoacoustic measures (eg, minimum masking level, loudness matching) to monitor the effectiveness of tinnitus management.	Weak against
Education and self-management	3	We suggest educational counseling to reduce the functional impact of tinnitus.	Weak for
	4	There is insufficient evidence to recommend for or against the use of web-based or app-based self-management for tinnitus.	Neither for nor against
	5	There is insufficient evidence to recommend for or against the use of computer-based games, training programs, or both for tinnitus self-care.	Neither for nor against
Amplification devices	6	We suggest hearing aids for tinnitus management in adults with hearing loss (see narrative for discussion of patients without hearing loss).	Weak for
	7	There is insufficient evidence to recommend for or against CROS hearing aids for tinnitus management in adults with single-sided deafness.	Neither for nor against
	8	We suggest cochlear implantation for tinnitus management in adults who meet candidacy requirements.	Weak for
	9	There is insufficient evidence to recommend for or against implantable BCDs for tinnitus management in adults with single-sided deafness.	Neither for nor against
	10	We suggest cochlear implants vs implantable BCD or CROS hearing aids for tinnitus management in adults with single-sided deafness who meet candidacy requirements.	Weak for
Sound-based intervention alone	11	There is insufficient evidence to recommend for or against auditory cognitive training (eg, frequency discrimination training, auditory attention training) for the reduction of tinnitus distress and functional impact.	Neither for nor against
	12.	We suggest the therapeutic use of sound for tinnitus self-care.	Weak for
	13.	There is insufficient evidence to recommend for or against sound therapy with altered music (eg, notched music therapy, spectrally altered music) to reduce the impact of tinnitus.	Neither for nor against
Behavioral intervention alone	14	We suggest CBT by a trained clinician for adults with bothersome tinnitus.	Weak for
	15	There is insufficient evidence to recommend for or against the following psychological interventions by a trained clinician for adults with bothersome tinnitus (unranked): acceptance and commitment therapy, mindfulness-based therapies, and mindfulness-based stress reduction.	Neither for nor against
Combined sound-based and behavioral intervention	16	We suggest sound therapy combined with CBT for tinnitus management by a multidisciplinary team.	Weak for
	17	We suggest sound enrichment with ongoing directed tinnitus education by an audiologist.	Weak for
Neuromodulation/neurostimulation	18	There is insufficient evidence to recommend for or against repetitive transcranial magnetic stimulation for tinnitus management.	Neither for nor against
	19	There is insufficient evidence to recommend for or against transcutaneous electric nerve stimulation for tinnitus management.	Neither for nor against
	20	There is insufficient evidence to recommend for or against transcranial direct current stimulation for tinnitus management.	Neither for nor against
	21	We suggest against low-level laser therapy for tinnitus management.	Weak against
Manual therapy	22	We suggest a multidisciplinary approach for assessing and treating patients with bothersome tinnitus and temporomandibular disorder, cervical spine dysfunction, or both to reduce the functional impact of tinnitus.	Weak for
Complementary and integrative health	23	There is insufficient evidence to recommend for or against acupuncture for tinnitus management.	Neither for nor against
Herbals, nutraceuticals, and supplements	24	We suggest against the use of ginkgo biloba, dietary or herbal supplements, or nutraceuticals for tinnitus management.	Weak against
Pharmacotherapy	25	We suggest against the use of anticonvulsants, antidepressants, antiemetics, antithrombotics, betahistine, intratympanic corticosteroid injections, or *N*-methyl D-aspartic acid receptor antagonists for tinnitus management.	Weak against

Abbreviations: app, application; BCD, bone conduction device; CBT, cognitive behavioral therapy; CROS, contralateral routing of signal/sound.

cluded that many participants with bilateral hearing loss who underwent cochlear implantation also demonstrated substantial reductions in tinnitus functional impact.[32] Furthermore, a high degree of satisfaction and the ability to maintain active duty status has been reported for service members who undergo cochlear implantation.[33]

Evidence indicated rare risks of harm associated with cochlear implantation, including postoperative infections, worsening tinnitus symptoms, postoperative meningitis, long-term facial nerve dysfunction, cochlear implant device failure, and electrode migration. Given the infrequent incidence of risks, the benefits of cochlear implantation for tinnitus management outweigh its harms and burdens.

The WG determined there was insufficient evidence to recommend for or against CROS hearing aids for tinnitus management in adults with SSD. A trial of CROS amplification is required before surgical procedures for SSD (eg, cochlear implantation, implanted BCDs). Very limited evidence exists to recommend for or against CROS hearing aids as a management tool for tinnitus.[26]

The WG also determined insufficient evidence to recommend for or against implantable BCDs in adults with SSD. BCDs include vari-

ous amplification devices that transmit sound to the inner ear by vibrating the skull to bypass the normal sound conduction pathway of the ear canal, tympanic membrane, and ossicular chain. On the balance of benefits and harms, the harms of implantable BCDs for tinnitus management in adults with SSD were considered to slightly outweigh its benefits. This finding was based on the available evidence, which indicated equivocal improvement for tinnitus functional impact and a low but real risk of substantial complications.

Finally, the WG suggests cochlear implants vs implantable BCDs or CROS hearing aids for tinnitus management in adults with SSD who meet candidacy requirements. Evidence suggests that cochlear implantation is associated with a reduced effect and distress of tinnitus compared with implantable BCDs or CROS hearing aids in adults with SSD.[26,34]

Sound-Based Intervention Alone (Recommendations 11-13)

The WG suggested therapeutic use of sound for tinnitus self-care. Evidence suggests this is associated with reduced self-perceived tinnitus handicap, promotes relaxation, and facilitates distraction from tinnitus. The use of sound for tinnitus self-care has been referred to as sound therapy or sound enrichment. Sound can be delivered with ear-level devices (eg, hearing aids, sound generators, wireless earphones) or through external sound-playing devices (eg, mobile phones, music devices, and tabletop sound spas) and implemented with or without professional guidance. Sound enrichment is typically most effective when combined with professional guidance.

Evidence suggests that the therapeutic use of sound (eg, broadband noise, mixed pure tones, and tinnitus-matched sound) is associated with reduced self-perceived tinnitus handicap.[35-38] Sound therapy can be generic or proprietary. Recommended use time varies across protocols, sound types, and devices. The WG's confidence in the quality of the evidence was low. The benefits were balanced with the potential harm of increased tinnitus loudness and the time necessary to achieve therapeutic effect. The patient focus group participants noted that sound therapy delivered via hearing aids was an important component of their tinnitus management.

The search for sound-based interventions for tinnitus yielded evidence on auditory cognitive training; therefore, the WG included this approach for consideration. The WG determined that there is insufficient evidence to recommend for or against auditory cognitive training, such as frequency discrimination training and auditory attention training. Studies that met the inclusion criteria focused on computer-based gaming modalities that targeted auditory attention, auditory memory, auditory processing speed, and frequency discrimination. The evidence suggests that auditory cognitive training might be associated with improved attention, memory, and concentration in patients with tinnitus.[39-41] Limited evidence for frequency discrimination training revealed no substantial reduction in self-perceived tinnitus handicap or tinnitus severity.[42] However, the body of evidence was limited, and confidence in the quality of evidence was very low.

The WG also determined that there is insufficient evidence to recommend for or against sound therapy with altered music (eg, notched music therapy, spectrally altered music). Study outcomes were mixed, and results were predominantly characterized by Tinnitus Handicap Inventory and Tinnitus Functional Index score reductions for the experimental and control groups.[43-46] By contrast, 2 other studies[47,48] found no significant change in their experimental or control groups. These therapies cannot be generalized to patients with severe hearing loss because most studies required that patients have hearing thresholds less than 70 dB hearing level (dB HL).

Behavioral Interventions Alone (Recommendations 14-15)

The WG recommended cognitive behavioral therapy (CBT) for tinnitus management. CBT focuses on improving thoughts, feelings, and behaviors associated with tinnitus. CBT was more effective than control conditions in reducing tinnitus distress and improving functionality.[49-52] The effectiveness of CBT is robust across modalities (eg, in-person, internet-based, telephone; individual, and group).[50-52] CBT was associated with reduced symptoms of anxiety and depression in patients with tinnitus.[49,50,52] To a lesser extent, evidence also suggests that CBT was associated with improved sleep[52,53] and QoL[53] in participants with bothersome tinnitus. Less is known about the efficacy of other psychological interventions (ie, acceptance and commitment therapy, mindfulness, mindfulness-based stress reduction, and relaxation training) in adults with bothersome tinnitus. Overall, the efficacy of CBT for reducing tinnitus distress has been supported more often than other psychological interventions.

Combined Sound-Based and Behavioral Interventions (Recommendations 16-17)

Combined sound-based and behavioral interventions have been associated with reductions in tinnitus effect compared with sound therapy alone.[22,37,54] There is evidence that the combination of sound therapy and CBT (based on the Progressive Tinnitus Management program) was associated with significant reductions in tinnitus effect and improved degree of confidence among patients in their ability to self-manage their tinnitus reactions.[22,54] There were no studies identified that compared the effectiveness of CBT as a standalone treatment with the combination of CBT and sound therapy. There is evidence to suggest there is benefit to providing sound enrichment with ongoing directed tinnitus education by an audiologist, as evidenced by clinically relevant reductions in the functional impact of tinnitus.[55-59] Additional evidence suggests the benefit of multiple sessions of tinnitus-specific educational counseling combined with hearing aids for hearing loss when appropriate, as evidenced by reductions in tinnitus distress regardless of counseling type (TRT-based counseling or tinnitus masking method).[59]

While there is consistent research to suggest that a combination of sound therapy and behavioral interventions is associated with reduced tinnitus distress, there were study limitations (ie, participant attrition rates, small sample size) that limit confidence in the data. Overall, the benefits of the treatment outweigh any risks or harm and the collective body of evidence is encouraging in that it shows a robust reduction in tinnitus-related distress when using a combination of sound-based and behavioral interventions.

Neuromodulation/Neurostimulation (Recommendations 18-21)

The WG determined there was insufficient evidence to make a recommendation for or against neuromodulation or neurostimulation. The eMethods in the Supplement provides more information.

Manual Therapy (Recommendation 22)

The WG suggests a multidisciplinary approach for evaluating and treating patients with bothersome tinnitus and temporomandibular disorder (TMD), cervical spine dysfunction, or both. This recom-

mendation applies to patients with somatosensory tinnitus, a subtype of tinnitus in which the tinnitus characteristics (eg, loudness, pitch) can be modulated by voluntary movements of the eyes, head, neck, or jaw. While there is no clinical consensus on diagnosing somatosensory tinnitus,[60] there is agreement that patients with an underlying biomechanical deficit that modulates their tinnitus may benefit from physical therapy services (eg, manual therapy) to address the underlying co-occurring cervical spine dysfunction or TMD as part of their tinnitus care.

Complementary and Integrative Health (Recommendation 23)

The WG determined that there is insufficient evidence to recommend for or against acupuncture for tinnitus management. The eMethods in the Supplement provides more information.

Herbals, Nutraceuticals, Supplements (Recommendation 24)

The WG suggests against the use of ginkgo biloba, dietary or herbal supplements, or nutraceuticals for tinnitus management. The eMethods in the Supplement provides more information.

Pharmacotherapy (Recommendation 25)

The WG suggests against the use of anticonvulsants, antidepressants, antiemetics, antithrombotics, betahistine, intratympanic corticosteroid injections, or *N*-methyl D-aspartic acid receptor antagonists for tinnitus management.[61,62] The eMethods in the Supplement provides more information.

Comparison With Other Guidelines

A recent SR comparing several tinnitus CPGs for chronic tinnitus in adults published between 2011 and 2021 identified 10 guidelines for analysis and comparison regarding treatment recommendations.[63] Recommendations for 13 types of tinnitus management strategies were compared. Large differences in guideline development and methods were identified, and reporting was judged to be poor in several guidelines. Seven of the 10 guidelines included a systematic search of the literature to identify the available evidence. Six of the 10 guidelines used a framework for guideline development. Counseling (5 of the 10 guidelines) and CBT (8 of the 10 guidelines) were the only interventions recommended for managing bothersome tinnitus by all the guidelines that included these interventions. TRT, sound therapy, hearing aids, and cochlear implantation were not unanimously recommended, either due to lack of evidence, a high risk of bias, or judgment of no benefit. The authors of the SR suggested that future guidelines could benefit from using validated reporting tools to improve reporting and transparency and inclusion of guideline experts and patients to improve the quality of CPGs on tinnitus. These recommendations were followed in developing the VA/DOD CPG (2024) by using reporting tools and guideline experts, multidisciplinary subject matter experts, and a patient focus group. The VA/DOD recommendations were compared with the recommendations in the SR. In addition to counseling (education) and CBT, other tinnitus management options suggested include tinnitus programs, such as TRT, Progressive Tinnitus Management, and Tinnitus Activities Treatment; sound therapy; hearing aids; cochlear implants; and manual therapy for TMD, cervical spine dysfunction, or both for managing bothersome tinnitus. One factor that contributes to differences between CPGs is the training and experience of the WG members who develop them. The WG for the new VA/DOD CPG for tinnitus comprised otolaryngologists, audiologists, psychologists, pharmacologists, other clinicians, and researchers who had experience evaluating and treating patients with tinnitus. All the WG members for this CPG were affiliated with either VA or DOD health care facilities. This combination of WG experience and circumstance, tempered by the time-tested processes of VA/DOD CPG development, resulted in a tinnitus guideline we hope is practical and useful for clinicians, patients, and caregivers.

Research Recommendations

The WG identified areas needing further research. Recommended research priorities included:

- Evaluate pretreatment and posttreatment effects of tinnitus interventions using validated outcome measures.
- Compare the efficacy of web-based or app-based training as standalone tinnitus care with clinician-guided tinnitus care combined with self-management.
- Evaluate the efficacy of amplification as a tinnitus intervention as a function of hearing status (eg, normal hearing, hidden hearing loss, and mild/moderate/severe hearing loss).
- Compare active vs passive sound therapy and the associations with tinnitus outcome measures, tinnitus functional impact, QoL, and secondary outcomes (eg, sleep, depression, and anxiety).
- Evaluate the therapeutic and long-term effects of different forms of CBT interventions and the benefits of cognitive training on tinnitus functional impact, QoL, and secondary outcomes (eg, sleep, depression, and anxiety).
- Conduct studies focused on internet-based therapies other than CBT and evaluate the associations with tinnitus functional impact and QoL.
- Conduct studies that specifically examine the effectiveness of CBT alone and CBT combined with sound therapy.
- Conduct large multisite, randomized, placebo-controlled clinical trials of repetitive transcranial magnetic stimulation to identify the most effective protocols for reducing the perception of tinnitus, severity of tinnitus, or both.
- Conduct large clinical trials of physical therapy, chiropractic, and other forms of musculoskeletal care to determine if these therapeutic approaches are effective for reducing the perception of tinnitus, severity of tinnitus, or both in individuals who have somatic components associated with underlying biomechanical issues of the head/neck/jaw.
- Evaluate the comparative effectiveness of different types of complementary and integrative whole health approaches to improve QoL with tinnitus.
- Conduct large clinical trials to determine whether effective pharmacological treatment of behavioral/mental health disorders (eg, major depressive disorder and generalized anxiety disorder) is associated with reductions in tinnitus severity for patients who experience these co-occurring conditions.

Conclusions

This synopsis of the VA/DOD CPG for tinnitus summarized the evidence and recommendations for 20 questions focused on evaluating and managing care for adults with bothersome tinnitus. The full CPG offers patients and clinicians a comprehensive overview of

evidence-based education and self-management, treatment options, and recommended outcome measures that could be used to monitor effectiveness and associations with other health outcomes with the overarching goal to improve patient health and well-being.

The CPG use of rigorous GRADE methods determined the strength of the recommendations. Findings of a lack of sufficient evidence were a direct result of evaluating the quality of the body of evidence and emphasize gaps in knowledge needing further study. Addressing these gaps may enable a more comprehensive evaluation of the potential benefits and limitations of various tinnitus care options, ultimately improving patient care and clinical practice.

The US VA/DOD CPG for tinnitus, published in 2024, was designed to promote evidence-based care, but it did not mandate required standard of care. Clinicians are encouraged to apply evidence-based practices within a patient-centered approach[64] and personalize health goals to align with the patient's capabilities, needs, and preferences. We recommend using the CPG to enhance communication, improve care quality, and achieve better patient outcomes. eModule 1 in the Supplement describes an algorithm for initial evaluation of tinnitus, and eModule 2 in the Supplement describes an algorithm for managing tinnitus and improving QoL.

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Conflict of Interest Disclosures: Dr Sherlock reported serving as a tinnitus advisor with the American Tinnitus Association's Tinnitus Advisor Program and responding to requests for information about tinnitus from the general public. Dr Edmonds reported being a paid employee of the Bay Pines VA Health Care System. Dr Myers reported being a collaborator of Progressive Tinnitus Management (PTM). Dr Zaugg reported nonfinancial support from the Veterans Health Administration and was one of the original developers of PTM. No other disclosures were reported.

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Additional Information: The full work group and advisor list can be found in the guideline.[10]

REFERENCES

1. Bhatt JM, Lin HW, Bhattacharyya N. Prevalence, severity, exposures, and treatment patterns of tinnitus in the United States. *JAMA Otolaryngol Head Neck Surg*. 2016;142(10):959-965. doi:10.1001/jamaoto.2016.1700

2. Messina A, Corvaia A, Marino C. Definition of tinnitus. *Audiol Res*. 2022;12(3):281-289. doi:10.3390/audiolres12030029

3. Jarach CM, Lugo A, Scala M, et al. Global prevalence and incidence of tinnitus: a systematic review and meta-analysis. *JAMA Neurol*. 2022;79(9):888-900. doi:10.1001/jamaneurol.2022.2189

4. Shargorodsky J, Curhan GC, Farwell WR. Prevalence and characteristics of tinnitus among US adults. *Am J Med*. 2010;123(8):711-718. doi:10.1016/j.amjmed.2010.02.015

5. Folmer RL, Griest SE, Martin WH. Chronic tinnitus as phantom auditory pain. *Otolaryngol Head Neck Surg*. 2001;124(4):394-400. doi:10.1067/mhn.2001.114673

6. Folmer RL, Martin WH, Shi Y. Tinnitus: questions to reveal the cause, answers to provide relief. *J Fam Pract*. 2004;53(7):532-540.

7. US Department of Veterans Affairs. Veterans benefits administration reports. Accessed February 18, 2025. https://www.benefits.va.gov/REPORTS/abr/.

8. Medicine Io. *Noise and Military Service: Implications for Hearing Loss and Tinnitus*. The National Academies Press; 2006.

9. Theodoroff SM, Lewis MS, Folmer RL, Henry JA, Carlson KF. Hearing impairment and tinnitus: prevalence, risk factors, and outcomes in US service members and veterans deployed to the Iraq and Afghanistan wars. *Epidemiol Rev*. 2015;37:71-85. doi:10.1093/epirev/mxu005

10. US Department of Veterans Affairs. VA/DOD clinical practice guidelines: tinnitus (2024). Accessed January 12, 2025. https://www.healthquality.va.gov/guidelines/CD/tinnitus/

11. Tunkel DE, Bauer CA, Sun GH, et al. Clinical practice guideline: tinnitus. *Otolaryngol Head Neck Surg*. 2014;151(2)(suppl):S1-S40.

12. US Department of Veterans Affairs. Accessed February 13, 2025. VA/DOD clinical practice guidelines. https://www.healthquality.va.gov/guidelines/

13. US Department of Veterans Affairs. VA/DOD clinical practice guidelines. Accessed February 18, 2025. https://www.healthquality.va.gov/policy/index.asp.

14. Andrews J, Guyatt G, Oxman AD, et al. GRADE guidelines: 14: going from evidence to recommendations: the significance and presentation of recommendations. *J Clin Epidemiol*. 2013;66(7):719-725. doi:10.1016/j.jclinepi.2012.03.013

15. Andrews JC, Schünemann HJ, Oxman AD, et al. GRADE guidelines: 15: going from evidence to recommendation-determinants of a recommendation's direction and strength. *J Clin Epidemiol*. 2013;66(7):726-735. doi:10.1016/j.jclinepi.2013.02.003

16. Atkins D, Eccles M, Flottorp S, et al; GRADE Working Group. Systems for grading the quality of evidence and the strength of recommendations I: critical appraisal of existing approaches The GRADE Working Group. *BMC Health Serv Res*. 2004;4(1):38. doi:10.1186/1472-6963-4-38

17. Connell J, Harrison E, Bassiouni A, et al. FiveQ: a new easy-to-use validated clinical instrument for tinnitus severity. *Clin Otolaryngol*. 2022;47(6):672-679. doi:10.1111/coa.13973

18. Fernández M, Cuesta M, Sanz R, Cobo P. Comparison of tinnitus handicap inventory and tinnitus functional index as treatment outcomes. *Audiol Res*. 2022;13(1):23-31. doi:10.3390/audiolres13010003

19. Henry JA, Griest S, Thielman E, McMillan G, Kaelin C, Carlson KF. Tinnitus functional index: development, validation, outcomes research, and

clinical application. *Hear Res*. 2016;334:58-64. doi:10.1016/j.heares.2015.06.004

20. Jacquemin L, Mertens G, Van de Heyning P, et al. Sensitivity to change and convergent validity of the Tinnitus Functional Index (TFI) and the Tinnitus Questionnaire (TQ): clinical and research perspectives. *Hear Res*. 2019;382:107796. doi:10.1016/j.heares.2019.107796

21. Rabau S, Cox T, Punte AK, et al. Changes over time of psychoacoustic outcome measurements are not a substitute for subjective outcome measurements in acute tinnitus. *Eur Arch Otorhinolaryngol*. 2015;272(3):573-581. doi:10.1007/s00405-013-2876-3

22. Henry JA, Thielman EJ, Zaugg TL, et al. Randomized controlled trial in clinical settings to evaluate effectiveness of coping skills education used with progressive tinnitus management. *J Speech Lang Hear Res*. 2017;60(5):1378-1397. doi:10.1044/2016_JSLHR-H-16-0126

23. Searchfield GD, Sanders PJ. A randomized single-blind controlled trial of a prototype digital polytherapeutic for tinnitus. *Front Neurol*. 2022;13:958730. doi:10.3389/fneur.2022.958730

24. Haines RH, Hepburn T, Tan W, et al. Effectiveness and cost effectiveness of digital hearing aids in patients with tinnitus and hearing loss: a randomised feasibility trial (THE HUSH Trial). *Pilot Feasibility Stud*. 2022;8(1):235. doi:10.1186/s40814-022-01188-9

25. Waechter S, Jönsson A. Hearing aids mitigate tinnitus, but does it matter if the patient receives amplification in accordance with their hearing impairment or not? a meta-analysis. *Am J Audiol*. 2022;31(3):789-818. doi:10.1044/2022_AJA-22-00004

26. Peters JPM, van Heteren JAA, Wendrich AW, et al. Short-term outcomes of cochlear implantation for single-sided deafness compared to bone conduction devices and contralateral routing of sound hearing aids—results of a randomised controlled trial (CINGLE-trial). *PLoS One*. 2021;16(10):e0257447. doi:10.1371/journal.pone.0257447

27. Daher GS, Kocharyan A, Dillon MT, Carlson ML. Cochlear implantation outcomes in adults with single-sided deafness: a systematic review and meta-analysis. *Otol Neurotol*. 2023;44(4):297-309. doi:10.1097/MAO.0000000000003833

28. Oh SJ, Mavrommatis MA, Fan CJ, et al. Cochlear implantation in adults with single-sided deafness: a systematic review and meta-analysis. *Otolaryngol Head Neck Surg*. 2023;168(2):131-142. doi:10.1177/01945998221083283

29. Marx M, Mosnier I, Venail F, et al. Cochlear implantation and other treatments in single-sided deafness and asymmetric hearing loss: results of a national multicenter study including a randomized controlled trial. *Audiol Neurootol*. 2021;26(6):414-424. doi:10.1159/000514085

30. Villavisanis DF, Mavrommatis MA, Berson ER, et al. Cochlear implantation in Meniere's disease: a systematic review and meta-analysis. *Laryngoscope*. 2021;131(8):1845-1854. doi:10.1002/lary.29393

31. Levy DA, Lee JA, Nguyen SA, McRackan TR, Meyer TA, Lambert PR. Cochlear implantation for treatment of tinnitus in single-sided deafness: a systematic review and meta-analysis. *Otol Neurotol*. 2020;41(8):e1004-e1012. doi:10.1097/MAO.0000000000002711

32. Yuen E, Ma C, Nguyen SA, Meyer TA, Lambert PR. The effect of cochlear implantation on tinnitus and quality of life: a systematic review and meta-analysis. *Otol Neurotol*. 2021;42(8):1113-1122. doi:10.1097/MAO.0000000000003172

33. Sommerfeldt JM, Fischer JL, Morrison DA, Pillion E, Bernstein J, Tolisano AM. Cochlear implantation in the active duty military population: a survey assessing military readiness and satisfaction. *Otol Neurotol*. 2021;42(4):549-557. doi:10.1097/MAO.0000000000003000

34. Donato M, Santos R, Correia F, Escada P. Single-sided deafness: bone conduction devices or cochlear implantation? a systematic review with meta-analysis. *Acta Otorrinolaringol Esp (Engl Ed)*. 2021;72(2):101-108. doi:10.1016/j.otorri.2020.02.013

35. Jin IK, Choi SJ, Ku M, Sim Y, Lee T. The impact of daily hours of sound therapy on tinnitus relief for people with chronic tinnitus: a randomized controlled study. *J Speech Lang Hear Res*. 2022;65(8):3079-3099. doi:10.1044/2022_JSLHR-21-00651

36. Li Y, Feng G, Wu H, Gao Z. Clinical trial on tinnitus patients with normal to mild hearing loss: broad band noise and mixed pure tones sound therapy. *Acta Otolaryngol*. 2019;139(3):284-293. doi:10.1080/00016489.2019.1575522

37. Li J, Jin J, Xi S, et al. Clinical efficacy of cognitive behavioral therapy for chronic subjective tinnitus. *Am J Otolaryngol*. 2019;40(2):253-256. doi:10.1016/j.amjoto.2018.10.017

38. Theodoroff SM, McMillan GP, Zaugg TL, Cheslock M, Roberts C, Henry JA. Randomized controlled trial of a novel device for tinnitus sound therapy during sleep. *Am J Audiol*. 2017;26(4):543-554. doi:10.1044/2017_AJA-17-0022

39. Kallogjeri D, Piccirillo JF, Spitznagel E Jr, et al. Cognitive training for adults with bothersome tinnitus: a randomized clinical trial. *JAMA Otolaryngol Head Neck Surg*. 2017;143(5):443-451. doi:10.1001/jamaoto.2016.3779

40. Wise K, Kobayashi K, Magnusson J, Welch D, Searchfield GD. Randomized controlled trial of a perceptual training game for tinnitus therapy. *Games Health J*. 2016;5(2):141-149. doi:10.1089/g4h.2015.0068

41. Xing M, Kallogjeri D, Piccirillo JF. Investigating the impact of cognitive training for individuals with bothersome tinnitus: a randomized controlled trial. *Otolaryngol Head Neck Surg*. 2021;165(6):854-861. doi:10.1177/0194599821994742

42. Hoare DJ, Van Labeke N, McCormack A, et al. Gameplay as a source of intrinsic motivation in a randomized controlled trial of auditory training for tinnitus. *PLoS One*. 2014;9(9):e107430. doi:10.1371/journal.pone.0107430

43. Li SA, Bao L, Chrostowski M. Investigating the effects of a personalized, spectrally altered music-based sound therapy on treating tinnitus: a blinded, randomized controlled trial. *Audiol Neurootol*. 2016;21(5):296-304. doi:10.1159/000450745

44. Yoo S, Yakunina N, Nam EC. Does listening to tinnitus frequency-filtered music relieve tinnitus? *J Audiol Otol*. 2022;26(3):147-152. doi:10.7874/jao.2022.00010

45. Piromchai P, Srisukhumchai C, Kasemsiri P, et al. A three-arm, single-blind, randomized controlled trial examining the effects of notched music therapy, conventional music therapy, and counseling on tinnitus. *Otol Neurotol*. 2021;42(2):335-340. doi:10.1097/MAO.0000000000002935

46. Tong Z, Deng W, Huang X, et al. Efficacy of tailor-made notched music training versus tinnitus retraining therapy in adults with chronic subjective tinnitus: a randomized controlled clinical trial. *Ear Hear*. 2023;44(4):670-681. doi:10.1097/AUD.0000000000001318

47. Therdphaothai J, Atipas S, Suvansit K, Prakairungthong S, Thongyai K, Limviriyakul S. A randomized, controlled trial of notched music therapy for tinnitus patients. *J Int Adv Otol*. 2021;17(3):221-227. doi:10.5152/iao.2021.9385

48. Stein A, Wunderlich R, Lau P, et al. Clinical trial on tonal tinnitus with tailor-made notched music training. *BMC Neurol*. 2016;16:38. doi:10.1186/s12883-016-0558-7

49. Landry EC, Sandoval XCR, Simeone CN, Tidball G, Lea J, Westerberg BD. Systematic review and network meta-analysis of cognitive and/or behavioral therapies (CBT) for tinnitus. *Otol Neurotol*. 2020;41(2):153-166. doi:10.1097/MAO.0000000000002472

50. Nyenhuis N, Golm D, Kröner-Herwig B. A systematic review and meta-analysis on the efficacy of self-help interventions in tinnitus. *Cogn Behav Ther*. 2013;42(2):159-169. doi:10.1080/16506073.2013.803496

51. Habeeb A, Hemaya M, Hemaya M, Kanegaonkar R. Telehealth in treating tinnitus: a systematic review and meta-analysis. *J Laryngol Otol*. 2023;137(11):1182-1192. doi:10.1017/S0022215123000373

52. Weise C, Kleinstäuber M, Andersson G. Internet-delivered cognitive-behavior therapy for tinnitus: a randomized controlled trial. *Psychosom Med*. 2016;78(4):501-510. doi:10.1097/PSY.0000000000000310

53. Beukes EW, Baguley DM, Allen PM, Manchaiah V, Andersson G. Audiologist-guided internet-based cognitive behavior therapy for adults with tinnitus in the United Kingdom: a randomized controlled trial. *Ear Hear*. 2018;39(3):423-433. doi:10.1097/AUD.0000000000000505

54. Henry JA, Thielman EJ, Zaugg TL, et al. Telephone-based progressive tinnitus management for persons with and without traumatic brain injury: a randomized controlled trial. *Ear Hear*. 2019;40(2):227-242. doi:10.1097/AUD.0000000000000609

55. Bauer CA, Berry JL, Brozoski TJ. The effect of tinnitus retraining therapy on chronic tinnitus: a controlled trial. *Laryngoscope Investig Otolaryngol*. 2017;2(4):166-177. doi:10.1002/lio2.76

56. Formby C, Yang X, Scherer RW. Contributions of counseling and sound generator use in tinnitus retraining therapy: treatment response dynamics assessed in a secondary analysis of a randomized trial. *J Speech Lang Hear Res*. 2022;65(2):816-828. doi:10.1044/2021_JSLHR-21-00210

57. Henry JA, Stewart BJ, Griest S, Kaelin C, Zaugg TL, Carlson K. Multisite randomized controlled trial to compare two methods of tinnitus intervention to two control conditions. *Ear Hear*. 2016;37(6):e346-e359. doi:10.1097/AUD.0000000000000330

58. Scherer RW, Formby C; Tinnitus Retraining Therapy Trial Research Group. Effect of tinnitus retraining therapy vs standard of care on tinnitus-related quality of life: a randomized clinical trial. *JAMA Otolaryngol Head Neck Surg*. 2019;145(7):597-608. doi:10.1001/jamaoto.2019.0821

59. Tyler RS, Stocking C, Ji H, Witt S, Mancini PC. Tinnitus activities treatment with total and partial masking. *J Am Acad Audiol*. 2021;32(8):501-509. doi:10.1055/s-0041-1731698

60. Michiels S, Cardon E, Gilles A, et al. The rapid screening for somatosensory tinnitus tool: a data-driven decision tree based on specific diagnostic criteria. *Ear Hear*. 2022;43(5):1466-1471. doi:10.1097/AUD.0000000000001224

61. Goljanian Tabrizi A, Safavi Naini A, Baradaran N. Short-term effect of gabapentin on subjective tinnitus in acoustic trauma patients. *Iran J Otorhinolaryngol*. 2017;29(91):95-100.

62. Chen JJ, Chen YW, Zeng BY, et al. Efficacy of pharmacologic treatment in tinnitus patients without specific or treatable origin: a network meta-analysis of randomised controlled trials. *EClinicalMedicine*. 2021;39:101080. doi:10.1016/j.eclinm.2021.101080

63. Meijers S, Stegeman I, van der Leun JA, Assegaf SA, Smit AL. Analysis and comparison of clinical practice guidelines regarding treatment recommendations for chronic tinnitus in adults: a systematic review. *BMJ Open*. 2023;13(9):e072754. doi:10.1136/bmjopen-2023-072754

64. Elwyn G, Frosch D, Thomson R, et al. Shared decision making: a model for clinical practice. *J Gen Intern Med*. 2012;27(10):1361-1367. doi:10.1007/s11606-012-2077-6