



Practice Differentiation Through Tinnitus Management

An Overview for Beginners

By Caitlin Turriff

With the changing landscape of hearing health care, many audiologists are seeking ways to distinguish themselves and their practices from other dispensing offices and big-box stores. One aspect of patient care that can help differentiate one's practice from the competition is tinnitus management.

Tinnitus, which is defined as a perceived sound that lacks an outside source, affects about 15–20 percent of the global population (Swain et al, 2016). Despite the large number of individuals who experience tinnitus, only about a quarter of those who report tinnitus feel it negatively

impacts daily life and actively seek out management options (Woelver et al, 2015). Upon first glance, tinnitus management may seem fairly straightforward—a typical visit could include a case history, audiological evaluation, tinnitus evaluation, and counseling. In actuality, there are diverse ways that tinnitus affects individuals resulting in the need for more comprehensive tinnitus evaluations and management options. This article will describe the different aspects of tinnitus evaluation, provide examples of tinnitus management, and examine ways to incorporate both into your practice.

Initial Evaluation

The first step of a tinnitus evaluation should include a detailed case history. To date, there is no definitive cause of tinnitus; however, it is commonly associated with hearing loss, noise exposure, head trauma, and infections/diseases of the ear (Swain et al, 2016). Because there is no universal cause, a thorough case history interview should educate the audiologist on the patient's perceived hearing ability, a description of the tinnitus, vestibular symptoms, current medications, and personal and family medical history. The information collected will help guide the hearing assessment and provide

clues as to what, if any, medical referrals are necessary.

In addition to the case history, it is important to consider the impact the tinnitus has on the patient's life and mental well-being. Using a screening tool may provide a more efficient and effective way of determining that impact. The Tinnitus and Hearing Survey (THS) is a ten-item questionnaire that helps determine whether the patient's complaints stem more from tinnitus or hearing loss (Henry et al, 2015a). Henry and colleagues (2015a) have divided the THS into two sections: statements relating to tinnitus and how it affects the patient's life (i.e. difficulty concentrating, difficulty sleeping, etc) and statements evaluating how hearing loss affects communication and listening (i.e. difficulty understanding the television, difficulty understanding in groups, etc). The patient's responses for each statement are rated on a scale of 0 (not a problem) to 4 (very big problem) and whichever section receives the higher score suggests it is the main contributor to the patient's complaints (Henry et al, 2015a). While no cutoff score is used to determine the direction of treatment, it allows the audiologist and the patient to discuss the root of the problem, how the tinnitus or hearing loss can be addressed, and enables the patient to make an informed decision regarding management. The THS can be used prior to other tinnitus questionnaires if the patient chooses to pursue tinnitus management (Henry et al, 2015a).

Whether used with or without the THS, different tinnitus questionnaires can provide additional information about tinnitus impact. One such questionnaire is the Tinnitus Handicap Questionnaire (THQ). The THQ is a self-report questionnaire that examines three

areas—social, emotional, and behavioral—hearing and tinnitus; and outlook on tinnitus (Kuk et al, 1990). The patient's responses to each of the 27 questions will provide information on the perceived severity of the tinnitus and how it affects daily life.

In addition to completing a tinnitus questionnaire, other measures of the patient's mental well-being could be considered. There is growing literature illustrating how commonly poor quality of life co-exists with tinnitus. A recent study found a relationship between tinnitus and both depression and perceived quality-of-life. As the severity, including perceived loudness, of tinnitus increases, quality-of-life decreases and the incidence of depression increases (Weidt, et al, 2015). Determining this information can help direct the course of tinnitus management and assist in determining if further referrals are necessary.

Examining what factors can both worsen and alleviate tinnitus could also be helpful in personalizing tinnitus management. Pan and colleagues (2015) studied this topic and discovered that these factors vary widely from person to person. Their research involved asking two questions: "What makes your tinnitus worse?" and "What makes your tinnitus better?" A closed set of answers were provided for both questions and the participants were instructed to choose the answer that best defined their experience. While there were many commonalities, such as a worsening of tinnitus in quiet environments or during times of increased stress, there were no definitive patterns. Some individuals found that being in the presence of background noise helped alleviate tinnitus while others felt it worsened tinnitus, and some felt that amount of sleep had an effect on tinnitus while others experienced

no relationship between tinnitus severity and sleep. Due to these differences, Pan and colleagues suggest determining subgroups of tinnitus and creating unique treatment plans for each (Pan et al, 2015).

The Evaluation

Once the intake interview and questionnaires are completed, it is time to begin the physical and auditory evaluations. Including all aspects of a typical hearing examination, i.e., otoscopy, immittance, speech and pure tone audiometry, and otoacoustic emissions, will provide information on overall ear health and hearing ability. These results will help determine whether any indicators of potential medical conditions are present and if a physician referral is warranted. Additionally, the findings of the hearing test will help guide the tinnitus evaluation (CPT Code 92599).

Evaluating tinnitus involves pitch matching, loudness matching, minimum masking level, residual inhibition, and loudness growth function (Henry and Meikle, 2000). The first four categories provide quantifiable measurements of tinnitus perception. Pitch and loudness matching will help determine at what frequency masking should be, and how the loudness of the tinnitus compares to hearing threshold. Residual inhibition and loudness growth function will establish the amount of white noise needed to mask the tinnitus, and whether masking can reduce the perception of tinnitus once that noise is silenced (Henry and Meikle, 2000).

An additional measure is the loudness growth function, which can provide information on the extent to which the patient is hypermonitoring their tinnitus (Carroll, 2013). The patient will rate the subjective loudness of his tinnitus on a scale of

one to 10, and then will rate the loudness of randomized presented tones, including the loudness match, on the same scale. The difference between the subjective loudness rating of the tinnitus and the rating of that same level on the randomized presentation will determine the extent of hypermonitoring (Carroll, 2013). For example, if the patient notes his tinnitus loudness is a seven, yet when presented with the loudness

further management is required, the audiologist may begin to discuss sound therapy and whether outside referrals are warranted.

Sound therapy is commonly used in tinnitus management and it can take several forms. The first, and sometimes simplest, form of sound therapy is use of a masking device. The sound can be generated from regular household items such as fans or a radio, to more expensive

This suggests that use of sound therapy can improve the negative effects of tinnitus.

Tinnitus Retraining Therapy (TRT) is used to make tinnitus a part of the subconscious. It was developed by Pawel Jastreboff and colleagues, and is based on the concept of neural plasticity and the ability of the brain to relearn how it interprets tinnitus. This approach achieves its goals in two ways: habituating both the reaction to and perception of the tinnitus (Jastreboff and Jastreboff, 2000). When a patient is receiving TRT, he uses sound therapy and receives counseling; the process may take up to 18-months. Despite this length of time, Henry and colleagues (2006) found that TRT may be a more effective approach for those suffering from severe tinnitus. They found, during an 18-month study, that the greater the perceived severity of tinnitus the better the results using TRT as compared to only receiving tinnitus masking (Henry et al, 2006).

Similar results were observed by Bauer and Brozoski (2011). They studied, over the course of 18 months, two groups of tinnitus sufferers who had normal hearing sensitivity through the speech frequencies. The two groups used sound generators and had three months of counseling but one group also received TRT. While both groups had statistically significant improvement, the group that also received TRT reported the greatest amount of benefit (Bauer and Brozoski, 2011). This suggests that the combined masking and counseling provided by TRT can alleviate negative tinnitus symptoms.

Cognitive Behavior Therapy (CBT) is another approach to tinnitus management. This treatment does require a referral as it can only be performed by a licensed therapist. The goal of CBT is to modify undesired behavior by changing behavior and cognitive

match he only rates it as a three, this difference in scores would suggest he is hypermonitoring his tinnitus. This result serves to both illustrate to the patient how loud his tinnitus actually is and to move the appointment toward the counseling stage.

Counseling and Management Options

Upon the completion of the examination, it is time to communicate the results with the patient. Counseling may be one of the most important parts of the tinnitus evaluation because it allows the audiologist to reassure the patient and to begin building the framework for a management approach. In some cases, discussing the results of the audiogram and tinnitus evaluation, and reassuring the patient, will be sufficient for managing the tinnitus. For others, a more involved discussion will be necessary. If

options like tabletop fountains and noise generators. The relief provided by masking tends to be immediate as it causes the ambient noise to rise enough to cover the tinnitus.

There is evidence in the literature that the use of masking devices can improve outcomes on tinnitus questionnaires. Henry and colleagues (2015b) studied the effects of using a hearing aid only versus wearing a hearing aid with sound generator on the results of the Tinnitus Functionality Index (TFI). Despite the different sound therapies, both groups received identical counseling and wore the devices for the same prescribed duration. At the end of the study, the researchers discovered both groups had significant reduction in mean TFI. The group using the device with sound generator showed a greater mean reduction in TFI, but the difference did not reach statistical significance (Henry et al, 2015b).

Various treatment options can provide relief to tinnitus sufferers, so continue to research the scientific literature and different treatment approaches.

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Signia's Pure13 BT primax leverages *Bluetooth* to improve overall wearer experience

When the first hearing aid with direct audio streaming was introduced in 2014, it garnered significant attention and helped to de-stigmatize hearing aids. Unfortunately, this did not translate to a significant increase in hearing aid adoption. Audio streaming, direct or otherwise, was simply not that important.

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* Study conducted at the University of Northern Colorado, 2015, examined the effectiveness of the new features of primax by collecting and analyzing ongoing EEG data while subjects performed speech testing. For both primax features SpeechMaster and EchoShield, the objective brain behavior measures revealed a significant reduction in listening effort when the feature was activated.

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structuring (Andersson, 2002). Some examples of what may be included in CBT include exposing the patient to sounds, relaxation techniques, and the restructuring of beliefs and thoughts regarding tinnitus (Hesser et al, 2011). In addition to its positive effects on tinnitus, the benefit of CBT can spread to other areas that may have been suffering as a result of tinnitus, including anxiety and depression (Hesser et al, 2011). The relief gained from using CBT may be long lasting, but due to the potential complexity of the treatment the patient must be willing to put in the work required for achieving successful outcomes.

Putting It All Together

Tinnitus evaluation and management can be a complex process. The severity of the tinnitus, the presence of hearing loss, and the effect the tinnitus has on the patient’s sense of well-being can vary widely. It is important for the audiologist to be educated on tinnitus evaluation and management. Various treatment options can provide relief to tinnitus sufferers, so continue to research the scientific literature regarding the different treatment approaches, obtain initial comprehensive and continuing education in tinnitus evaluation and management, and seek out professional relationships with audiologists who have already established a successful tinnitus program. Additionally, it is important to network with physicians and psychologists so referrals are quick and easy. Audiologists equipped with the proper knowledge, training, and resources in this area will be able to provide an added value for their patients who suffer from tinnitus. 🎧

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Illustration by Johanna van der Sterre.

References

Andersson G. (2002) Psychological aspects of tinnitus and the application of cognitive-behavioral therapy. *Clin Psychol Rev* 22(7):977–990.

Bauer CA, Brozoski TJ. (2011) Effect of tinnitus retraining therapy on loudness and annoyance of tinnitus: a controlled trial. *Ear Hear* 32(2):145–155.

Carroll J. (2013) Hypermonitoring—measuring the perceptual mismatch in tinnitus in programmed serenade devices. Poster presented at the Sixth International NCRAR Conference, Portland, OR.

Henry JA, Griest S, Zaugg TL, Thielman E, Kaelin C, Galvez G, Carlson KF. (2015a) Tinnitus and hearing survey: a screening tool to differentiate bothersome tinnitus from hearing difficulties. *Am J Audiol* 22:66–77.

Henry JA, Frederick M, Sell S, Griest S, Abrams H. (2015b) Validation of a novel combination hearing aid and tinnitus therapy device. *Ear Hear* 36(1):42–52.

Henry JA, Schechter MA, Zaugg TL, Griest S, Jastreboff PJ, Vernon JA, Kaelin C, Meikle MB, Lyons KS, Stewart BJ. (2006) Outcomes of clinical trial: tinnitus masking versus tinnitus retraining therapy. *J Am Acad Audiol* 17:104–132.

Henry JA, Meikle MB. (2000) Psychoacoustic measurements of tinnitus. *J Am Acad Audiol* 11:138–155.

Hesser H, Weise C, Westin VZ, Andersson G. (2011) A systematic review and meta-analysis of randomized controlled trials of cognitive-behavioral therapy for tinnitus distress. *Clin Psychol Rev* 31:545–553.

Jastreboff and Jastreboff. (2000) Tinnitus retraining therapy (TRT) as a method for treatment of tinnitus and hyperacusis patients. *J Am Acad Audiol* 11:162–177.

Kuk FK, Tyler RS, Russell D, Jordan H. (1990) The psychometric properties of a tinnitus handicap questionnaire. *Ear Hear* 11(6):434–442.

Pan T, Tyler RS, Ji H, Coelho C, Gogel SA. (2015) Differences among patients that make their tinnitus worse or better. *Am J Audiol* 24: 469-476.

Swain SK, Nayak S, Ravan JR, Sahu MC. (2016) Tinnitus and its current treatment—still an enigma. *J Formos Med Assoc* 115:139–144.

Weidt S, Delsignore A, Meyer M, Rufer M, Peter N, Drabe N, Kleinjung T. (2015) Which tinnitus-related characteristics affect current health-related quality of life and depression? A cross-sectional cohort study. *Psych Res* (2016) <http://dx.doi.org/10.1016/j.psychres.2016.01.065>.

Wolever R, Price R, Hazelton AG, Dmitrieva NO, Bechard EM, Shaffer JK, Tucci DL. (2015) Complementary therapies for significant dysfunction from tinnitus: treatment review and potential for integrative medicine. *J Evid-Based Comp Altern Med*. 2015:1–8.