

# Tinnitus Issues and Management: 2017

By ANNETTE MAZEVSKI, AuD, PhD, DOUGLAS L. BECK, AuD, AND COLIN PAXTON, MA

As we continue to support the needs of the tinnitus patient and practitioner—from sound generators to therapy approaches—it is important to maintain flexibility in treatment. This article looks at the three most-common tinnitus treatment approaches used within a clinic or with an individual patient. Recent evidence suggests the therapist is 9 to 10 times more important to the outcome of therapy than the specific treatment approaches, and new tools like Oticon's Tinnitus SoundSupport are providing better options in the treatment of tinnitus patients with hearing aids.

In 2017, tinnitus remains an enigma. Tinnitus is a phantom sound or noise perceived in the ear(s) most often described as “buzzing, ringing, crickets, whistling, humming, static, high pitch tone...”<sup>1</sup> There are, in general, two types of tinnitus: 1) Subjective tinnitus occurs in the absence of a known external stimulus (this type of tinnitus represents 95-98% of all tinnitus presentations), and 2) Objective tinnitus has a physical sound source.

Although there is no cure for tinnitus, the good news is—and it is very good news—that for perhaps up to 90% of tinnitus sufferers<sup>2</sup> hearing care professionals (HCPs) and other healthcare providers can help provide tinnitus management and relief. Although HCPs have a lot of information about tinnitus with respect to “grouped data” and trends across populations, we may be unsure as to the specific etiology in a given patient. Further, although we may be uncertain of the etiology in an individual, we clearly know many contributing factors including: stress, anxiety, depression, PTSD, ototoxic medicines, ear or head trauma, a multitude of specific medical conditions, and more.

Quite often, for the patient suffering from chronic, annoying, or debilitating tinnitus, hearing loss is a major concern. The “80/80 Rule”<sup>1</sup> states approximately 80% of all people with sensorineural hearing loss (SNHL) have tinnitus and approximately 80% of all people with tinnitus have SNHL. People who complain of bothersome tinnitus perceive something which is distressing and uncomfortable most (or all) of their waking hours. Interestingly, this is somewhat in direct contrast to people with (only) hearing loss, the majority of whom do not perceive a particularly audible or blatant sensory cue indicative of hearing loss.

As such, many people with tinnitus are unaware of their hearing loss, because their hearing loss is “relatively silent” as compared to their perceived tinnitus. Therefore, although hearing loss and tinnitus are most often present in the same person, tinnitus may be the overwhelming symptom from which the patient seeks relief.

Although exact numbers are impossible to determine, it is estimated that 50 million Americans have tinnitus.<sup>3,4</sup> However,

the approximate number of people seeking help for these conditions is far less. Davis and El Rafeie<sup>5</sup> suggested 10% of all people in the United Kingdom perceive tinnitus, with 5% describing their tinnitus as annoying and about 1% reporting their tinnitus has a severe impact upon their lives. Applying these percentages to the total US population of some 325 million people,<sup>6</sup> the quantity of people with tinnitus who might describe it as annoying is about 16.25 million people (5%), and perhaps 3.25 million people (1%) who might experience tinnitus as having a severe impact on their lives.

Henry, Dennis, and Schechter<sup>7</sup> estimated tinnitus may be clinically significant in 10-20% of those who experience it, indicating a possible pool of 5-10 million people who might seek relief. Thus, only a minority of people with tinnitus appear to experience tinnitus problematic enough (ie, causes difficulty with respect to hearing, concentration, sleep, is perhaps unrelenting and impacts their thoughts, feelings, and emotional status) to seek and require professional help to manage their tinnitus.

## Psychological Issues and Treatment Options

Thompson et al<sup>8</sup> report tinnitus is associated with depression and anxiety disorders, and tinnitus may severely and adversely impact one's quality of life and the functional health status of some people. Fagelson<sup>9</sup> noted more than half of all patients with tinnitus experience “comorbid psychological injury (such as PTSD) or psychological illness (depression, anxiety, OCD).” Benton<sup>10</sup> reported that, of more than 300 tinnitus patients reported by the VA in Atlanta, Ga, some 61% were diagnosed with at least one mental health disorder. That is, tinnitus patients may have secondary psychological issues which may benefit from professional diagnosis and management.

Thompson et al<sup>8</sup> performed a scoping review of more than 5,000 medical records to catalog psychological therapies for people with tinnitus. A total of 25 component themes within psychological therapy were identified, including:



**Annette Mazevski AuD, PhD**, is Manager of Technology Assessment, **Douglas L. Beck AuD**, is Executive Director of Academic Sciences, and **Colin Paxton, MA**, is National Training & Education Manager, Government Services, at Oticon Inc, Somerset, NJ.

- Tinnitus education
- Psycho-education
- Evaluation treatment rationale
- Treatment planning
- Problem-solving behavioral intervention
- Thought identification
- Thought challenging
- Worry time
- Emotions
- Social comparison
- Interpersonal skills
- Self-concept
- Lifestyle advice
- Acceptance and defusion
- Mindfulness
- Attention
- Relaxation
- Sleep
- Sound enrichment
- Comorbidity
- Treatment reflection
- Relapse prevention, and
- Common therapeutic skills.

Further, they stated the most frequently reported therapies are cognitive behavioral therapy (CBT), tinnitus education, and Internet-delivered CBT. Of note, their review of more than 5,000 medical records indicated very few audiologists offered more than a handful of these psychological therapies. Indeed, the therapies noted above, when provided for tinnitus management, are generally not offered by audiologists and are, rather, provided by counselors, social workers, psychologists, and other mental health providers.

Degeest, Keppler, and Corthals<sup>11</sup> reported the impact of chronic tinnitus on listening effort based on a dual-task paradigm. They evaluated two groups of subjects: 13 normal-hearing young adults with chronic tinnitus, and a control group of matched subjects without tinnitus. They determined that listening effort for the group with tinnitus was significantly greater than for the control group. They reported “listening effort was considered to be related to cognitive processes for speech understanding; namely, selective attention, working memory, and processing speed...listening effort significantly increased in the tinnitus group.”

This information underscores the value of multiple healthcare providers as necessary members of the tinnitus management

team. Although the vast majority of people experiencing tinnitus can be effectively managed via hearing care professionals using educational and sound therapy approaches, there exist many people for whom tinnitus is their *primary complaint*, who may need additional management—which is different from the expertise of the HCP. Therefore, a team approach is advocated here to assure maximal tinnitus relief for all patients.

## Common Tinnitus Treatment Approaches

Fortunately for clinicians and individuals suffering from tinnitus, a variety of treatment approaches are available. Treatment options are diverse and can be combined and layered to support individual needs, ranging from therapeutic techniques using sounds designed to promote habituation to tinnitus, to counseling in support of managing emotional reactions to tinnitus.

### 1) Progressive Tinnitus Management.

Tinnitus is the most common service-connected disability among veterans in the United States, followed by sensorineural hearing loss. In 2015, 1.35 million claims at the Department of Veterans Affairs (VA), representing 7.9% of all veterans receiving service-connected compensation, were for tinnitus.<sup>12</sup> The prevalence and impact of these issues among veterans has driven considerable attention and research into prevention and treatment approaches. In 2014, a comprehensive program entitled Progressive Tinnitus Management (PTM) was introduced as an evidence-based and clinically-useful framework for treating patients suffering from bothersome tinnitus.<sup>13</sup>

PTM follows a treatment flow from the most basic referral level (Level 1) through individual counseling (Level 5), when appropriate. Most patients are effectively managed using the first three levels, with Levels 4 and 5 reserved for patients that require more intensive and/or individual support:<sup>2</sup>

- **Level 1: Referral.** Patients reporting tinnitus to a healthcare provider are referred to an audiologist for further assessment;
- **Level 2: Audiometric evaluation.** Tinnitus and Hearing Survey; hearing aids (with or without additional sound generator as individually appropriate);
- **Level 3: Skills education.** Audiologist

and mental health provider teach self-management skills to address negative reactions to tinnitus.

- **Level 4: Interdisciplinary evaluation.** Comprehensive evaluation by audiologist and a psychologist who understands tinnitus and possible connections with/to anxiety, sleep disorders, PTSD, etc.
- **Level 5: Individual services.** One-on-one services provided to patient as long as needed to craft an effective treatment package to adequately address the reaction to tinnitus (sound therapy, counseling, self-management techniques, cognitive-behavioral therapy, etc).

(Authors’ note: More information about PTM, including links to guides and free workbooks can be accessed at the National Center for Rehabilitative Auditory Research website: <https://www.ncrar.research.va.gov/Education/Documents/TinnitusDocuments/Index.asp>).

**2) Tinnitus Retraining Therapy.** Tinnitus Retraining Therapy (TRT) incorporates sound therapy protocols designed to promote habituation to bothersome tinnitus. TRT uses directive counseling strategies to demystify tinnitus and to ultimately render the tinnitus as a neutral signal that does not elicit a negative response. In essence, TRT is intended to address reactions to tinnitus from the limbic (emotional) and autonomic (involuntary) nervous systems.<sup>14</sup>

TRT has also been used as a treatment approach for hyperacusis (oversensitivity to sounds), misophonia (negative reaction to sounds), and phonophobia (fear of sound). Patients more likely to experience greater benefits from TRT include those with softer perceptions of tinnitus intensity, more recent onset of tinnitus, higher pitch of tinnitus, noticeable attenuation of tinnitus in response to sound generation, lower hearing thresholds, a high initial Tinnitus Handicap Inventory (THI) score,<sup>15</sup> and a positive outlook toward treatment.<sup>16</sup>

TRT uses sound therapy in a structured way to desensitize the limbic and autonomic nervous systems via the presentation of constant low-level broadband sounds. Using a TRT model, the ideal loudness setting for a sound generator is achieved at the point when perception of tinnitus and external sounds blend together and the tinnitus is still audible. Further, it is important that the sound enrich-

ment (from amplification or sound generation device) does not cause an aversive reaction.

The protocol calls for sounds to be used 24 hours a day to achieve the goal of permanent habituation.<sup>17</sup> Patients engaged in TRT are encouraged to avoid silence while enhancing ambient background sounds using nature sounds or music. For individuals with hearing loss, background sounds can be increased by the use of hearing aids. Counseling sessions include patient education to demystify tinnitus and to teach patients about the underlying causes and effects of tinnitus, and the introduction of methods which may result in tinnitus habituation. Successful outcomes are achieved when the patient is no longer bothered by the presence of their tinnitus and he/she notices tinnitus less frequently, despite being aware of it.

**3) Cognitive Behavioral Therapy.** Initially introduced in the 1960s, Cognitive Behavioral Therapy (CBT) is a counseling approach designed to address “cognitive misinterpretations, negative emotional reactivity, and dysfunctional attentional processes” which may lead to negative reactions to tinnitus which could require intervention.<sup>18</sup> CBT addresses the negative psychological reactions to tinnitus by changing the way an individual perceives and feels about their tinnitus.

The effectiveness of CBT has recently been explored, and questions have been raised regarding the continued effectiveness of this approach. Johnsen and Friberg<sup>19</sup> show reduced therapeutic relief (for unipolar depression) over time, as well as better outcomes for patients treated by experienced psychologists versus less-experienced therapists—demonstrating the potential value of a skilled clinician applying CBT. Tyler and Mohr<sup>20</sup> reported inherent challenges in fitting patients into categories which limit options for treatment, thus leading to additional counseling approaches, such as mindfulness therapy<sup>21</sup> and acceptance and commitment therapy (ACT).<sup>22</sup>

Regardless of the particular approach used within a clinic or with an individual patient, the protocol is the framework we use to provide structure to the treatment approach based on guiding principles and evidence. According to Miller and colleagues<sup>23</sup> from the International Center for Clinical Excellence, the therapist is 9 to 10 times more important to the outcome of therapy than the method of choice.

**Tinnitus SoundSupport**

The use of group and/or individual therapy, along with sound generator options, establishes a personalized yet generally suitable solution essential for the tinnitus patient. Coauthor Annette Mazevski<sup>24</sup> evaluated 34 patients at three military-related sites using Oticon’s Tinnitus SoundSupport (TSS). The patients in her report were fitted with Alta1 Pro Ti. Patients were given the choice to use a variety of TSS sounds with varying amounts of modulation. In all, the majority of patients found TSS a beneficial feature in alleviating tinnitus symptoms. The sound quality of Alta1 Pro Ti was highly rated (separate from TSS), and a significant reduction in the Tinnitus Functional Index<sup>25</sup> was noted in all but one patient (Figures 1 and 2). The following year, data was again collected at two of the three original sites to see if user satisfaction with Tinnitus SoundSupport and Alta1 Pro Ti sound quality remained consistent.<sup>26</sup>

Of the original 34 participants, 16 participants were available for follow-up. A questionnaire was filled out by the participants in which they evaluated their progress with Alta1 Pro Ti and Tinnitus SoundSupport. Overall findings indicated that Tinnitus

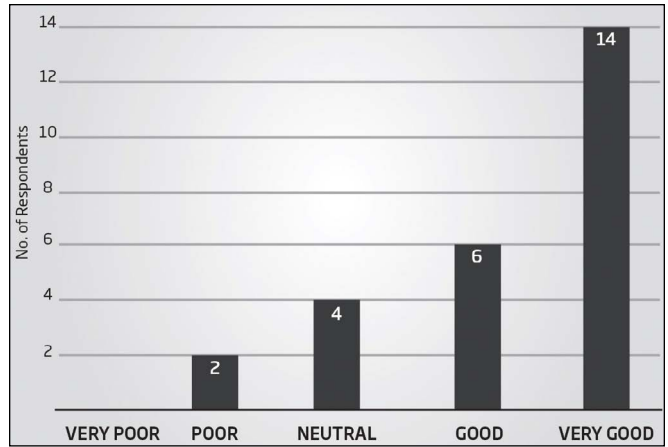


Figure 1. Patient report of Tinnitus SoundSupport (TSS) for 34 patients (2015).<sup>24</sup>

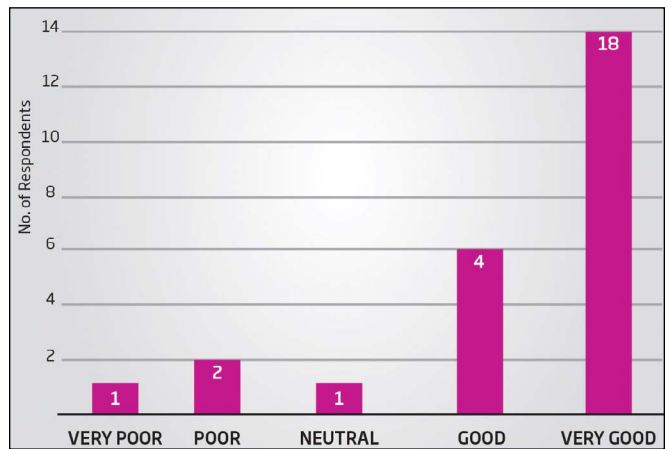


Figure 2. Patient report of sound quality of Alta1 Pro Ti hearing aids (2015).<sup>24</sup>

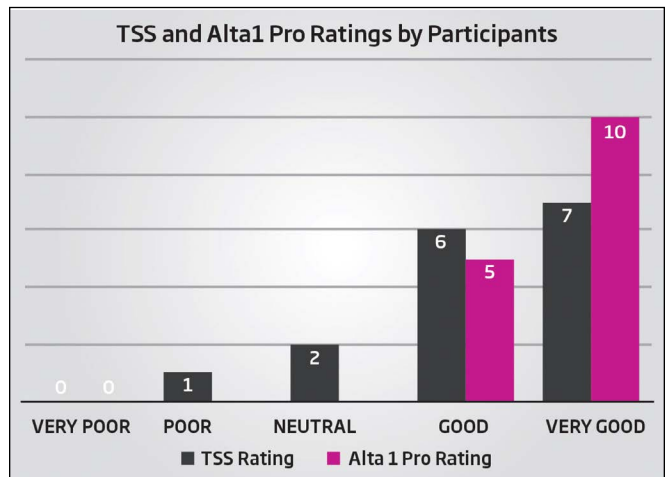


Figure 3. TSS and Alta1 Pro Ti ratings from the one-year follow-up data gathering (2016).<sup>26</sup>

SoundSupport continued to be a beneficial solution to individuals who had previously experienced bothersome tinnitus, and the sound quality of Alta1 Pro Ti continued to be highly rated (Figure 3). Lastly, TFI scores remained unchanged from the previous year.

An interesting observation from the 2016 follow-up data involved a small number of individuals reporting improvement in their tinnitus using Alta1 Pro without the TSS feature, and one who stopped using TSS altogether due to the benefit he received from amplification only. These statements are in agreement with past evidence in which tinnitus patients using amplification primarily for their hearing loss, concomitantly reported improvement in their tinnitus symptoms.<sup>27</sup>

In addition to the Alta Pro, Nera Pro, and Ria Pro products, the Tinnitus SoundSupport feature will be available in all levels of Opn (mid-2017). The TSS feature in Genie will maintain its spectrum of broadband and ocean sounds, different levels of modulation settings, automatic level steering, and the ability to enable/disable the hearing aid microphone so the wearer can choose to only listen to support sounds.

The effectiveness of the TSS feature, in conjunction with the extremely sophisticated Velox chip, is intended to aid the tinnitus patient regardless of the listening environment. For example, when located in a challenging acoustic environment, OpenSound Navigator can analyze acoustic information from the environment and balance them to maintain the level and location of those sounds. By appropriately amplifying and maintaining the integrity of the acoustic environment, the tinnitus patient may derive benefit from amplification alone.

When Tinnitus SoundSupport is enabled along with automatic level steering, the amount of masking provided by Opn can diminish as ambient noise gets louder. When not in complex listening situations, another option could be to utilize the Soft Speech Booster feature. This feature provides the ability to hear soft speech by adjusting low-level kneepoints in the higher frequencies, providing greater access to high frequency information in quieter environments.

## Conclusion

The goal for all tinnitus patients is the same:

to improve their quality of life. Unfortunately, there is no cure for tinnitus. The discomfort, struggle, and unrelenting presence of tinnitus is well known and is clearly detrimental with regard to quality of life. As we continue to support the needs of the tinnitus patient and practitioner—from sound generators to therapy approaches—it is important to maintain flexibility in treatment approaches. That is, sometimes one tinnitus management approach works very well for a particular patient, and sometimes another approach is warranted. Further, there are a multitude of sound sources available in contemporary hearing aids. We recommend pleasant, natural, and non-aversive sounds (ie, such as ocean waves) and excellent, high-quality hearing aids, to deliver the very best sound quality. ▶

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CORRESPONDENCE can be addressed to HR or Dr Mazevski at: [axm@oticonusa.com](mailto:axm@oticonusa.com)



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