

Does Tinnitus Retraining Therapy Improve Quality of Life?



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Tinnitus retraining therapy (TRT)

was developed in the late 1980s by Pawel Jastreboff, who was studying tinnitus in animal models, and Jonathan Hazell, who pioneered the use of low-level broadband sound therapy for treatment of tinnitus. Jastreboff created the neurophysiological model of tinnitus, which describes the role of the limbic system (involved in emotional responses) and autonomic nervous system (responsible for many bodily functions) in the negative reactions to hearing tinnitus. To this model, Jastreboff and Hazell added principles of sound therapy to create TRT, which is a treatment protocol that includes counseling and sound therapy. TRT prescribes a specific method of counseling called directive counseling, in which the therapist provides advice and guidance to the patient's decisions. Sound therapy is often achieved with ear-level devices, usually in the form of sound generators, hearing aids, or a combination of the two instruments. Patients are also encouraged to keep some sort of sound in their environment at all times,

called an enriched sound environment. The purpose of sound therapy and enriched sound environments is to reduce the perception of the tinnitus sound and prevent tinnitus from ever being the only sound heard by the patient. Since its origin, TRT has been a fundamental tool of many providers of tinnitus care, and the underlying principles have been the basis for other treatment models developed over the years.

For the past decade, a group of academic civilian researchers has partnered with colleagues in military hospitals to create the Tinnitus Retraining Therapy Trial Research Group. They are investigating the efficacy of TRT and are assessing the separate contributions of sound therapy and counseling to TRT. In the most recent study, participants were randomly assigned to one of three treatment groups: TRT including counseling and sound therapy achieved with bilateral ear-level sound generators; partial TRT including counseling combined with short-acting "placebo" sound generators; and what the authors termed "standard of care," a patient-centered counseling approach based on surveys

of tinnitus treatment in the military and professional best practices.¹ All groups were encouraged to use enriched environmental sound throughout the day. By comparing the treatment results among the groups, the researchers' study design made possible the separation of the effects of sound therapy versus directive counseling, while comparing the efficacy of TRT with the standard-of-care treatment.

Baseline and treatment data were collected from August 4, 2011, to June 20, 2017, at six U.S. military hospitals. Participants had to have had tinnitus for at least one year, with medically or surgically treatable causes ruled out. None of the study participants had significant hearing loss, which otherwise might have confounded the utility of the sound generators. They also could not have had prior treatment within the past year and were required to have a baseline score of at least 40 on the Tinnitus Questionnaire, showing that tinnitus was having at least a moderately severe effect on their quality of life.

Participants enrolled in the standard and partial TRT groups were assigned to use bilateral sound generators

that were identical in appearance and initial operation. Those in the partial TRT group used sound generators that produced a constant low-level broadband output for the initial 40 minutes of operation, after which the output decreased by 1 dB every minute until becoming silent. Both researchers and participants were blinded as to whether participants had received standard sound therapy or placebo devices (called double-blinding). If the devices were checked by audiologists, the placebo sound generator output was restored to the initial volume level setting within approximately 3 seconds after removal from the ears. Counseling also reinforced the expectation that output from the sound generators would appear to decrease over time for both the standard and placebo TRT treatment groups.

All participants were counseled to maintain a sound-enriched environment throughout the day, meaning they were to avoid very quiet environments. This is a current strategy used in many treatment approaches to reduce the relative loudness of a patient's tinnitus. Audiologists were formally trained in TRT, and standardized protocols were

implemented to provide as close to identical treatment experiences as possible within and across hospitals. The study included 151 participants.

The Tinnitus Questionnaire was used as the primary outcome measure, and participants were assessed prior to treatment and at follow-up visits at three, six, 12, and 18 months after the initial treatment visit. Other assessments used included the Tinnitus Functional Index, Tinnitus Handicap Inventory, measures of depression, anxiety, and hearing handicap and a visual scale of tinnitus severity (similar to visual pain scales with faces depicting various states of distress, called a visual analog scale).

The overall results were similar across groups. Most importantly, all groups experienced significant improvement in rating their quality of life outcomes with tinnitus over the 18-month follow-up period. Change in questionnaire scores from baseline to 18-month follow-up revealed no meaningful differences among the treatment groups. That is, there was no meaningful difference in the changes in the quality of life measures when comparisons were made between groups receiving standard TRT and partial TRT, standard TRT and

standard of care, or partial TRT and standard of care.

There was no difference in treatment effects for sound therapy as prescribed by TRT versus partial TRT implemented with placebo sound therapy. This finding indicates that sound therapy from sound generators may not be necessary when TRT directive counseling is combined with an enriched sound environment, at least when treating tinnitus patients who have no greater than a mild hearing loss. This conclusion is further supported by the fact that the standard-of-care counseling approach had a similar effectiveness to the standard and partial TRT treatments. This study highlights the importance of counseling in tinnitus treatment and suggests that enriched environmental sound therapy in combination with counseling may be sufficient for achieving treatment success. Sound generators may be of lesser importance in the TRT treatment process for these individuals. 

1 Scherer, R. W., & Formby, C., for the Tinnitus Retraining Therapy Trial Research Group. (2019, May 23). Effect of tinnitus retraining therapy vs. standard of care on tinnitus-related quality of life. *JAMA Otolaryngology—Head & Neck Surgery*. Advance online publication. doi:10.1001/jamaoto.2019.0821

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