

# ReSound Tinnitus Management: ReSound Relief - Piecing the Tinnitus Puzzle Together

Michael Piskosz, MS  
Global Medical Affairs

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## ABSTRACT

Hearing care professionals (HCPs) have long been challenged with providing appropriate tinnitus services relative to the number of people who are seeking help. These challenges include a lack of a universally agreed upon tinnitus management protocol, understanding the existing protocols that are offered, and implementing these services into a clinical and profitable model. Efficiency is also a challenge, as accommodating the needs of people suffering from tinnitus can consume a lot of valuable clinical time. In this paper we discuss the clinically validated components of the ReSound Relief app and its efficacy in helping to manage tinnitus.

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Tinnitus is much more common than we often think. It is believed that the prevalence of tinnitus at any given point in time is over 25%, and the prevalence of those experiencing frequent tinnitus is almost 8%.<sup>1</sup> It is estimated that approximately 90% of people suffering from persistent tinnitus do not seek help.<sup>2</sup> The reasons for not seeking help can range from the person not knowing where to go to there not being anyone in their immediate geographic location that actively offers tinnitus services. Also, some of these individuals may not experience their tinnitus as bothersome enough to seek medical treatment. They may even find solutions on their own that work for them personally. However, this still leaves a very large portion of this population without the help they need.

There are a number of existing protocols available to assist in tinnitus management. The more common management programs are Tinnitus Retraining Therapy (TRT)\*, Progressive Tinnitus Management (PTM) and Cognitive Behavioral Therapy (CBT). Other programs such as Tinnitus Activities Treatment (TAT) and Mindfulness Based Tinnitus Therapy are also available. Although each of these programs has unique strategies and recommendations, they all share a few common underlying principles. For one thing, all of the programs promote that sound therapy combined with counseling, offers the best chance of success. Therefore, they all suggest a combined approach, incorporating both sound therapy and counseling into their protocols. There are also a number of proprietary hardware-driven tinnitus management programs, such as “the Levo System” from Otoharmonics and “Neuromonics”. Both of these also introduce counseling components to their protocols, which

are used in combination with their proprietary hardware solutions. Because there are so many tinnitus management options, it is easy to see why many HCPs find providing tinnitus service confusing and challenging, and many people suffering from tinnitus struggle to understand what might be the best solution for them.

With the introduction of mobile applications (apps) in recent years, people suffering from tinnitus have direct access to more tinnitus tools than ever before. Not all of these apps are based on clinical standards, and many offer nothing more than a library of sounds to play. However, there are apps available that focus on helping the individual to manage tinnitus. ReSound Relief is a good example. It is a tinnitus-focused app that includes not only a library of high-definition sounds, but also interactive exercises and meditations. In addition, counseling information is provided to educate the user on how to appropriately manage their tinnitus.

The goal of ReSound Relief is to support both the hearing care professional (HCP) and patient with convenient access to tinnitus management tools and education as they collaborate to create the best plan of action. The question is, with so many different approaches and management programs for tinnitus management, can an app like ReSound Relief bring all the pieces of the puzzle together, and provide measurable benefit to those who use it? In this paper we will discuss the efficacy of ReSound Relief, and how it incorporates a variety of sound therapy and informational counseling tools that have been shown to be effective for tinnitus management.

\*Websites for tinnitus management protocols can be found in the Appendix.

## SOUND THERAPY

The main goal of sound therapy is to divert one's attention away from the tinnitus. This is accomplished by presenting other sounds in order to minimize the perceived contrast between the tinnitus and the background environment (Figure 1). For example, tinnitus is easily detected in a quiet room since there is a large discrepancy between the loudness of the tinnitus and the quietness of the environment. By enriching the environment with sound, we increase the loudness of the background environment, thereby making the tinnitus less prominent and less noticeable. Sound therapy can have immediate effects, helping to reduce tinnitus audibility (e.g. masking/partial masking) which can also potentially result in taming the underlying tinnitus. Sound stimulation may also reverse or modify the abnormal cortical reorganization thought to be responsible for tinnitus.<sup>3</sup>

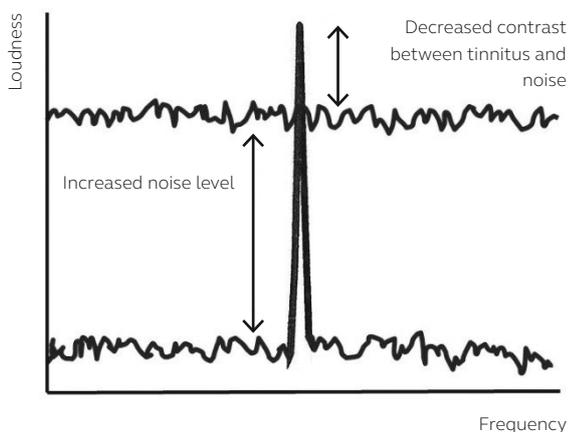


Figure 1: Increasing the background noise level reduces the contrast between the tinnitus and the background sound level.

Individuals with tinnitus have varied preferences for the sounds used in sound therapy. This shouldn't come as a big surprise. View someone's music list on their smartphone or tablet and the chances two people having the exact same playlist are highly unlikely. The sounds we listen to, whether they are by choice or by-products of a particular environment, vary significantly from person to person.<sup>4</sup> The sounds we prefer to listen to can even vary according to specific factors such as mood, time of day, or location, to name a few. Searchfield et al.<sup>3</sup> pointed out that sounds used for sound therapy can vary in their temporal, spectral and emotion-evoking characteristics, and showed that individual differences can influence the effectiveness of specific sounds over others. Henry et al.<sup>5</sup> asked study participants with tinnitus to evaluate different noises and nature-based sounds for sound therapy, and found that Air and Water sounds caused the least amount of annoyance to the subjects' tinnitus. These sounds were preferred over the other options of narrowband and broadband stimuli, as well as other nature sounds.

In the past, people suffering from tinnitus have had limited sound therapy options, which has made it challenging to find the flexibility and personalization suggested by many tinnitus management protocols. A basic instrument that generates white noise or a set of headphones and a CD player were two of the more flexible options in the past. Times have changed, and in recent years tinnitus has moved more to the forefront of our industry, as it appears to be a growing concern for many people.

As mentioned earlier, 8% of the population experiencing tinnitus have it to a degree where it could be clinically treatable.<sup>1</sup> In fact, the US Veterans Administration Annual Benefits report stated that there was an approximately 44% increase of tinnitus-related service connections to veterans between 2014 and 2016. Furthermore, tinnitus contributes to 7.5% of all service connections, which is the largest percentage of patient compensation in the Veterans Administration.<sup>6</sup> With what appears to be a growing number of tinnitus people suffering from tinnitus requiring clinical services to help manage the tinnitus, having solutions that incorporate both clinically validated elements and meet the demands of patient individuality is paramount for successful implementation of sound therapy.

Because the needs and preferences for sound therapy can vary greatly from person to person, ReSound Relief incorporates a library of sounds that differ in their spectral and temporal characteristics, as Searchfield et al.<sup>3</sup> suggested was important to accommodate individuals, and also includes a variety of air and water based sounds, which Henry et al.<sup>5</sup> showed to be effective in reducing annoyance (Figure 2).



Figure 2: Combine up to 5 sounds, including air and water sounds, from ReSound Relief's High-definition sound library and create the soundscape that helps best.

## COUNSELING

It is generally agreed that education and counseling play a large role in effective tinnitus management, and clinicians should educate people who have persistent, bothersome tinnitus about management strategies. Counseling should include information on the link between tinnitus and hearing loss, as well lifestyle factors that can have positive and negative effects on tinnitus management. Additional information on the damaging effects of excessive noise exposure and hearing protection from noise should be presented. Follow-up appointments and reassessment of the tinnitus should be considered if the tinnitus remains bothersome or if it worsens over time.<sup>2</sup>

However, because the tinnitus population is under-served and often does not know where to turn, or has nowhere to turn in their immediate geographic location, retrieving this information can present challenges. Most commonly, many people turn to the internet and use search engines to research information on tinnitus and tinnitus manage-

ment. Because of a lack of credible information, the unfortunate reality is that many of these individuals are led to believe their tinnitus can be cured quickly. This can lead to misguided online searches for key words like ‘tinnitus cures’ and ‘eliminate tinnitus’, which can expose these individuals to unproven and sometimes costly remedies and claims that have no evidence-based merit. In addition, with the increase of app usage, a number of sound therapy and tinnitus-related apps have been developed and made available on the corresponding app stores. Many of these apps offer sound files to choose from, but most fall short when it comes to providing clinically-based informational counseling on how to appropriately manage tinnitus.

The opportunity to learn new tinnitus information and management concepts should be made available to anyone suffering from tinnitus. Everyone learns at different rates and speeds, and the degree to which counseling and information is presented depends on the person’s ability to recall information and can be modified accordingly.<sup>7</sup> Although informational counseling is an important part of successful tinnitus management, it has been shown that 40-80% of the information can be forgotten immediately.<sup>8</sup> Furthermore, if individuals cannot recall the counseling information, they are more likely to be less satisfied and less compliant with treatment recommendations, and to experience poorer outcomes to treatment.<sup>9</sup> A logical assumption from these findings is that individuals could likely utilize the information more effectively if they had a resource allowing them quick and convenient access to the information when they need it. Resound Relief is designed with this need in mind. It incorporates a variety of educational topics in the Learn section, such as ‘What causes tinnitus?’, ‘Common tinnitus therapies’ and ‘Better Sleep’ tips, among others (Figure 3).

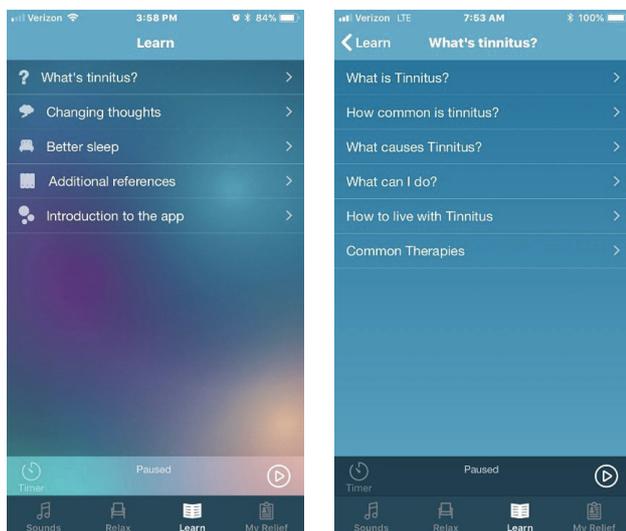


Figure 3: The Learn section offers a variety of information counseling topics to help educate users.

## EFFICACY OF RESOUND RELIEF

ReSound Relief incorporates a number of clinically-validated elements, such as sound therapy and informational counseling. However, does simply incorporating these elements make ReSound Relief a valid platform for managing tinnitus? A research group led by Professor Henryk Skarzynski, M.D., at the World Hearing Center of the Institute

of Physiology and Pathology of Hearing in Warsaw, Poland, showed that subjects who used the ReSound Relief app as their primary tinnitus management tool, presented reduced tinnitus perception after three months.

Using two objective measures to help quantify tinnitus perception, the Tinnitus Functional Index (TFI) and the Tinnitus Handicap Inventory (THI) questionnaires, the research group found significant reduction in both measures. Before using the ReSound Relief app, the grouped TFI average was 45.7, indicating a moderate tinnitus problem, and after using Resound Relief for three months, the TFI score reduced to 30.5, indicating a mild tinnitus problem. For the second measure, the grouped THI average before using the ReSound Relief app was 53.4, indicating a moderate tinnitus problem, and 32.2 after using ReSound Relief for three months, indicating a mild tinnitus problem.<sup>10</sup> This study supports the use of ReSound Relief as an effective tool in helping to manage tinnitus.

Additional support for the use of the ReSound Relief app comes from clinicians themselves. A 2015 survey showed that many clinical audiologists would recommend the ReSound Relief app to their patients struggling with tinnitus. Fifty-three Veteran’s Administration clinical audiologists collectively scored a 4.5/5 rating, when asked the question ‘Would you recommend ReSound Relief to your tinnitus patients?. In this survey, a ‘5’ represented a ‘Strongly Agree’ response, and ‘1’ represented a ‘Strongly Disagree’ response.<sup>11</sup>

Additionally, many of the features in ReSound Relief have been developed with some of the leading tinnitus experts in hearing healthcare. For example, the meditation feature combines guided meditations created by both Dr. Jennifer Gans and the Student Wellness Center at Dartmouth College.

Many of the Learn section items have been developed in collaboration with Dr. Jim Henry and his team at the National Center for Rehabilitative Auditory Research (NCRAR), who are responsible for the creation and clinical implementation of the PTM protocol. ReSound Relief is also endorsed by tinnitus organizations, such as the Tinnitus Practitioners Association, a professional organization of hearing care professionals dedicated to providing tinnitus and sound sensitivity care.

## PIECING THE TINNITUS PUZZLE TOGETHER

There is evidence that ReSound Relief can help individuals manage their tinnitus. In the sea of apps aimed at those with tinnitus, ReSound Relief is unique as it is designed specifically for the needs of the tinnitus population based on clinical standards and evidence-based tools. As hearing healthcare apps proliferate, it is important to choose ones that are validated to show they provide true benefit to users. Because apps provide the flexibility for personalization and the mobility for convenience, validated apps can be powerful tools to help complement clinical concepts and practice. ReSound Relief brings the most important and validated tinnitus concepts together, helping to piece the tinnitus puzzle together for many who so desperately need it.

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## APPENDIX

TRT:	<a href="http://www.tinnitus-pjj.com/">http://www.tinnitus-pjj.com/</a>
PTM:	<a href="https://www.ncrar.research.va.gov/education/documents/tinnitusdocuments/index.asp">https://www.ncrar.research.va.gov/education/documents/tinnitusdocuments/index.asp</a>
TAT:	<a href="https://medicine.uiowa.edu/oto/research/tinnitus-and-hyperacusis">https://medicine.uiowa.edu/oto/research/tinnitus-and-hyperacusis</a>
Mindfulness Based Tinnitus Therapy:	<a href="http://mindfultinnitusrelief.com/index.html">http://mindfultinnitusrelief.com/index.html</a>
Otoharmonics:	<a href="https://otoharmonics.com/">https://otoharmonics.com/</a>
Neuromonics:	<a href="http://neuromonics.com/">http://neuromonics.com/</a>
Dartmouth College:	<a href="https://students.dartmouth.edu/wellness-center/wellness-mindfulness/relaxation-downloads">https://students.dartmouth.edu/wellness-center/wellness-mindfulness/relaxation-downloads</a>

### Worldwide Headquarters

GN Hearing A/S  
 Lautrupbjerg 7  
 DK-2750 Ballerup  
 Denmark  
 Tel.: +45 4575 1111  
 resound.com

CVR no. 55082715