

## *Hearing Aids & Tinnitus*

**Tinnitus is overwhelmingly connected to some level of hearing loss. Augmenting the reception and perception of external noise can often provide relief from the internal sound of tinnitus.**

Most patients develop tinnitus as a symptom of hearing loss, caused either by age, long-term hearing damage, or acute trauma to the auditory system. According to the general scientific consensus, hearing loss causes less external sound stimuli to reach the brain. In response, the brain undergoes neuroplastic changes in how it processes different sound frequencies. Tinnitus is the product of these maladaptive neuroplastic changes.

Patients with hearing loss and tinnitus may find relief from the use of hearing aids and other sound amplification devices. Hearing aids are small electronic devices worn in or behind the ear. Using a microphone, amplifier, and speaker, hearing aids supplement the volume of outside noise and increase the amount of sound stimuli received and processed by the body's auditory system.

In a [2007 survey of hearing health professionals](#), respondents self-reported that roughly 60% of their tinnitus patients experienced at least some relief when wearing hearing aids; roughly 22% patients found significant relief.

Hearing aids are effective for several reasons:

### *Masking and Attentional Effects*

Hearing aids can augment the volume of external noise to the point that it covers (masks) the sound of tinnitus. This makes it more difficult to consciously perceive tinnitus and helps the brain focus on outside, ambient noises. The masking impact of hearing aids is particularly strong for patients who have hearing loss in the same frequency range as their tinnitus.

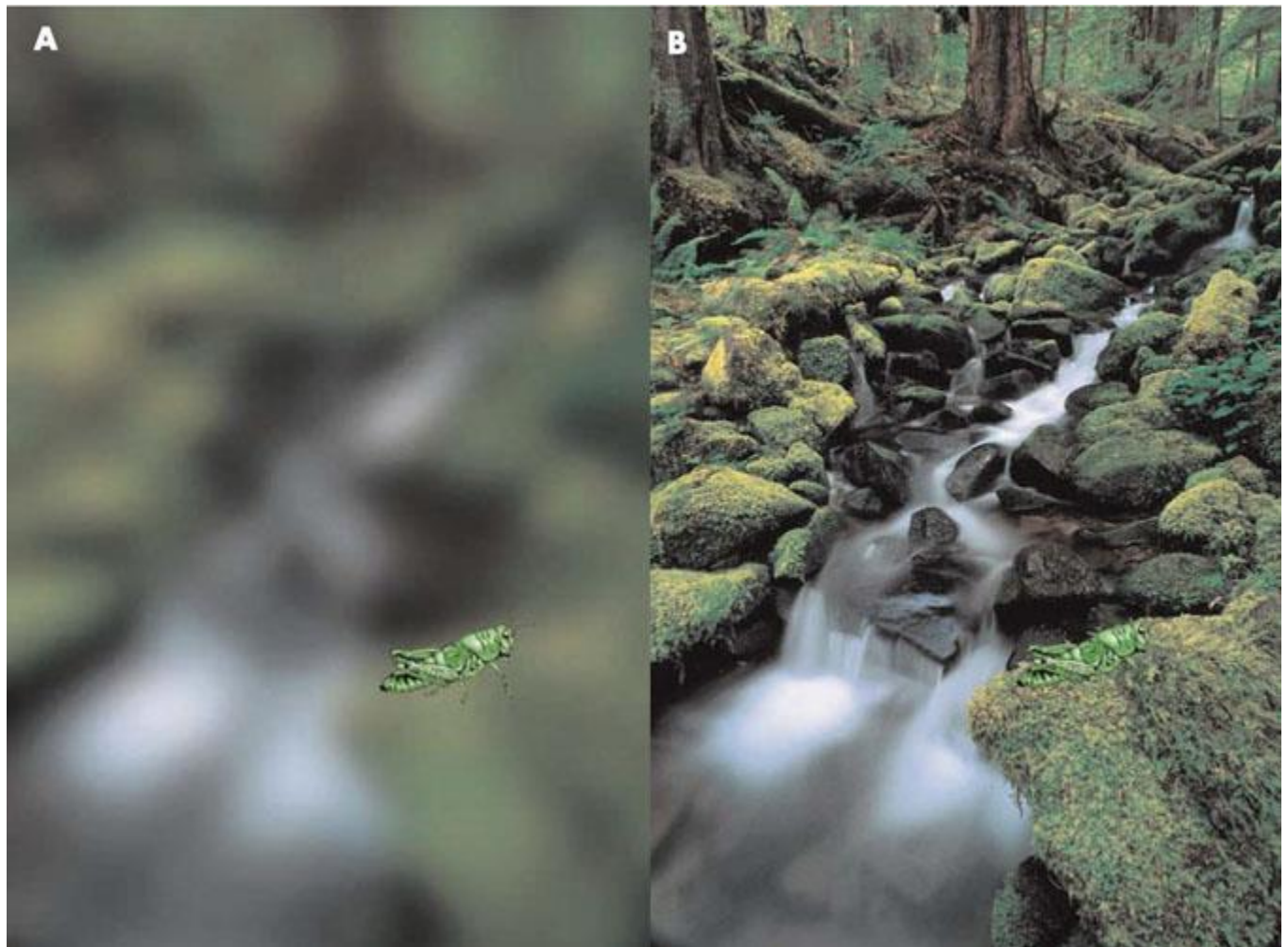
### *Auditory Stimulation*

Increasing the volume of external noise also increases the amount of auditory stimulation received by the brain. There may be benefits to stimulating the brain's auditory pathways with soft background sounds that might not otherwise be heard.

## *Improved Communication*

Loud tinnitus can make it difficult — or even impossible — for patients to participate in regular communicative and social activities: follow a conversation, talk on the phone, watch television, listen to the radio, etc. Hearing aids help by augmenting the external volume of these activities above the perceived volume of tinnitus. As a result, patients may feel less personal frustration and social isolation.

To better understand how hearing aids can help with tinnitus, consider the two images below as simple visual representations of tinnitus and hearing loss. Imagine that the cricket represents a person's tinnitus, and the background image represents background sounds.



In **Picture A**, the person has a hearing loss. The background sound is indistinct, and the cricket (tinnitus) is very clear. In **Picture B**, the person has been fitted with a hearing aid, and the background is clear and rich in detail. Although the cricket (tinnitus) is still present, it blends into the background. The listener's attention is diverted to other features of the environment. The success of hearing aids in managing tinnitus depends on how well background sounds can be made to blend with tinnitus.

Modern digital hearing aids, with open-fit designs and patient-customized hearing loss profiles, may be particularly useful in cases of tinnitus. Moreover, many newer hearing aids include supplemental sound masking functionality (white noise or other artificial ambient sound played directly into the ear) that further covers the perception of tinnitus.

Like most tinnitus treatments, hearing aids may work best when paired with a structured tinnitus education program and some form of patient counseling.

## Considerations

**Lifestyle and Comfort:** Research suggests hearing aids are most effective when they are used consistently during waking hours. This requires the patient to wear the devices on a full-time basis.

**Age:** While hearing aids may benefit most patients, some studies suggest that they are most effective for younger patients and those with a shorter history of tinnitus.

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