



VA research on **HEARING LOSS**

VA researchers are studying ways to prevent, diagnose, and treat hearing loss and related issues. They are also addressing a wide range of technological, medical, rehabilitative, and social issues associated with tinnitus and blast exposure.

ABOUT HEARING LOSS

- Hearing loss affects approximately 37.5 million Americans aged 18 and over, including more than half of those over age 75. Hearing problems—including tinnitus, which is a perceived ringing or other type of noise in the ears—are by far the most prevalent service-connected disability among Veterans.
- Some hearing loss is permanent, but can be reduced through the use of hearing aids. Only about one in five people who would benefit from hearing aids uses them.
- Conductive hearing loss, which is due to damage to the eardrum and middle ear structures, can often be reversed through surgery or medication. Sensorineural hearing loss, caused by damage to the inner ear and auditory nerve, is permanent, but can often be helped through the use of hearing aids.
- Many Veterans score normally on hearing tests but have difficulty understanding speech. This condition, called auditory processing disorder, is often associated with blast exposure.

VA RESEARCH ON HEARING LOSS: OVERVIEW

- VA employs more than 1,370 audiologists, 410 audiology health technicians, and 450 speech-language pathologists, making VA the largest employer of audiologists and speech-language pathologists in the United States.
- In 1997, VA established the National Center for Rehabilitative Auditory Research (NCRAR) to study hearing problems in Veterans, and to develop effective treatments. Researchers work to alleviate communication, social, and economic problems resulting from hearing loss and tinnitus.
- Among the topics studied at NCRAR are methods of early detection of hearing loss; the effects of certain diseases or conditions, such as diabetes and multiple sclerosis, on auditory functioning; and the impact of auditory problems on speech perception.
- NCRAR researchers are also looking at ways to improve speech recognition in noisy areas for people with hearing impairments, and studying the combined

effects of aging and noise exposure on hearing.

SELECTED MILESTONES AND MAJOR EVENTS

- 1997** – Established the [National Center for Rehabilitative Auditory Research](#) (NCRAR) in Portland, Oregon
- 2000** – [Demonstrated](#), with NIH, that three types of analog hearing aids provided substantial improvements for users both in quiet and noisy environments
- 2005** – Published a comprehensive protocol for the management of tinnitus, now referred to as [Progressive Tinnitus Management](#) (PTM)
- 2014** – [Linked](#) exposure to jet propulsion fuel to auditory processing problems
- 2019** – [Established](#) that blast exposure increases the likelihood of decreased sound tolerance in Veterans and service members
- 2021** – [Found](#) that the likelihood of screening positive for PTSD, depression, or anxiety is increased for those reporting moderate to severe tinnitus

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RECENT STUDIES: SELECTED HIGHLIGHTS

- **VA Portland researchers developed an assessment of Veterans' lifetime noise exposure.**

The Lifetime Exposure to Noise and Solvents Questionnaire (LENS-Q) evaluates both continuous and immediate noise exposure (such as from firearm use) in both military and non-military settings. Researchers evaluated the survey with 690 service members and Veterans. They showed that the LENS-Q was able to accurately predict hearing loss, tinnitus, and subjective hearing difficulties. ([American Journal of Audiology](#), May 17, 2021)

- **Difficulty distinguishing voices in a crowded room may be caused by an auditory processing problem,**

according to a study by VA Portland researchers and colleagues. People with hearing impairment have difficulty distinguishing multiple voices in a noisy environment. This may be caused by an overly broad binaural pitch fusion, say the researchers. For people with this problem, the ears blend different sounds together in a way that makes words unintelligible. ([Journal of the Association for Research in Otolaryngology](#), April 21, 2021)

- **Mental health symptoms are strongly associated with tinnitus severity,**

found an NCRAR study. Tinnitus and mental health disorders often

occur together. Researchers surveyed nearly 900 Veterans with tinnitus. They found that the likelihood of screening positive for PTSD, depression, or anxiety was increased for those who reported moderate, severe, or very severe tinnitus. ([Military Medicine](#), Jan. 25, 2021)

- **Older Veterans with sensory loss receive the same level of end-of-life care from VA as those without sensory loss,**

according to a Corporal Michael J. Crescenz VA Medical Center study. Researchers looked at data on more than 42,000 deceased Veterans. They found that end-of-life care quality indicators were similar between Veterans with hearing or vision loss and those without. Patients with hearing loss had slightly lower pain management scores and less satisfaction with communication. ([Journal of the American Geriatric Society](#), April 2020)

- **Tinnitus rates in active duty service members have increased significantly in recent years,**

found a study by South Texas VA researchers and colleagues. Rates of tinnitus more than tripled in service members from 2001 to 2015. The team estimates that 6.3 out of every 1,000 service members had tinnitus in 2015, up from 1.8 out of every 1,000 in 2001. ([American Journal of Audiology](#), Dec. 16, 2019)

- **PTSD and traumatic brain injury are linked to worsening tinnitus,**

according to a VA San Diego study. Researchers assessed 2,600 Marines before and after combat deployment. They found that both conditions were linked to worsening tinnitus, particularly among Veterans who sustained TBIs as a result of blast exposure. Tinnitus progression also increased with hearing loss. ([Military Medicine](#), Dec. 1, 2019)

- **Deep brain stimulation showed promise for treatment-resistant tinnitus,**

in a trial by San Francisco VA researchers and colleagues. After an optimization period, participants received treatment for 24 weeks. The pilot trial showed encouraging results for using this method to treat severe tinnitus. There were no safety concerns. ([Journal of Neurosurgery](#), Sept. 24, 2019)

- **Blast exposure is linked to decreased sound tolerance,**

according to a VA Portland study. People with decreased sound tolerance experience negative reactions to everyday sounds. In a study of 426 participants, 33% of service members and 48% of Veterans with blast exposure had decreased sound tolerance. Fewer participants who had not been exposed to blasts showed decreased sound tolerance. ([Scientific Reports](#), July 15, 2019)

For more information on VA studies on hearing loss and other key topics relating to Veterans' health, please visit www.research.va.gov/topics

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