

Early evidence suggests hybrid cochlear implants may benefit millions with common form of hearing loss

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People with a common form of hearing loss not helped by hearing aids achieved significant and sometimes profound improvements in their hearing and understanding of speech with hybrid cochlear implant devices, according to a new multicenter study led by specialists at NYU Langone Medical Center.

In the study, described online ahead of print in the journal *The Laryngoscope* July 7, researchers at 10 medical centers and private clinics in the United States implanted hybrid cochlear implants into one ear of 50 men and women. All study volunteers had badly damaged high-frequency, inner-ear hair cells, which prevented them from understanding speech, especially in the presence of background noise. All still had sufficient low-frequency hearing, which allowed them to tell apart some sounds and forestalled any use of a regular cochlear implant.

A year after receiving the device, 45 [study participants](#) showed overall improvement in their hearing and [speech recognition](#), and no one's hearing and speech recognition got worse.

"Our study offers early evidence that potentially millions more people with high-frequency hearing loss, who cannot benefit from a [hearing aid](#), could instead possibly benefit from a hybrid cochlear implant," says lead study investigator J. Thomas Roland, MD, the Mendik Foundation Chairman of the Department of Otolaryngology-Head and Neck Surgery

at NYU Langone. Roland, who also serves as co-director of NYU Langone's cochlear implant program, has nearly 30 years of experience in research and caring for people with the devices, which were first approved for use in the United States in 1984, and he has installed many hybrid implants, which were approved for adults by the US Food and Drug Administration in 2014.

The hybrid implant differs from the traditional device in that it has a shorter electrode (less than 2 centimeters long) that does not have to be inserted as deeply into the spiral-shaped sensory structure (the cochlea) in the inner ear. When placed correctly, the technique preserves more residual, natural, low-frequency hearing and augments high-frequency hearing with electrical stimulation.

The National Institute on Deafness and Other Communication Disorders estimates that some 26 million American adults between the ages of 20 and 69 suffer from some loss of high-frequency hearing, which makes speech recognition especially difficult.

According to Roland, the loss of high-frequency hearing had left all study participants "in a difficult spot." Many were failing at work and in social environments because of their inability to hear and understand speech.

Roland says hearing aids were not an option for them because the sound-amplifying tools cannot sufficiently raise high-frequency sounds to improve understanding of speech, especially when there is any kind of background noise.

Roland also says the study participants had "too much residual hearing to lose," so having traditional cochlear implants—one in each ear to replace both high- and low-frequency hearing—was not an optimal option (although five study participants did eventually choose this route.)

Among the study participants, 15 with total loss of high-frequency hearing and moderate loss of low-frequency hearing saw improvements in standard tests of their ability to understand set phrases and sentences read back to them. Their scores for correctly identifying spoken words and phrases rose from a baseline average of 21 percent before implantation to 67 percent a year after implantation and activation of their device.

For 14 other study participants with severe or total loss of their residual low-frequency hearing, test scores for correctly identifying certain spoken words and phrases improved from 12 percent to 54 percent, and from 14 percent to 35 percent, respectively. Study participants' [hearing](#) was assessed every few months.

Researchers' report that adverse events with the device, which typically costs about \$30,000 and involves an operation lasting less than an hour to install, were relatively rare and consisted primarily of mild postoperative dizziness that quickly went away, and ringing sounds in the ear that also subsided after device activation.

More information: [onlinelibrary.wiley.com/doi/10 ...
1002/lary.25451/full](https://onlinelibrary.wiley.com/doi/10.1002/lary.25451/full)

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