

Chronic Conductive Hearing Loss May Result in Poorer Speech Discrimination Ability

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BOSTON, MASSACHUSETTS – According to a newly published study led by Harvard Medical School scientists at Massachusetts Eye and Ear, chronic conductive hearing loss may have lasting negative effects on speech recognition.

The research, [published Sept. 6](#) in the journal *Ear and Hearing*, suggests that not properly treating infections or other conditions that chronically affect the middle ear may lead to neural deficits and difficulty hearing in noisy environments.

“Our results suggest that chronic sound deprivation can lead to speech recognition difficulties consistent with cochlear synaptopathy, a condition also known as hidden hearing loss. Accordingly, clinicians should consider providing amplification in the management of unilateral conductive hearing loss”

-Stéphane Maison, PhD, Assistant Professor of Otolaryngology at Harvard Medical School

Chronic Conductive Hearing Loss May Have Lasting Effects

Conductive hearing loss occurs when sound transmission from the ear canal to the inner ear is impaired, leading to a reduction in sound levels and an inability to hear soft sounds. **Sensorineural hearing loss**, on the other hand, occurs in the inner ear when the conversion of sound-induced vibrations into electrical signals in the auditory nerve is impaired.

Middle-ear infections are the most common cause for doctor visits and medication prescriptions among U.S. children, with about 75 percent experiencing one or more ear infections before age 3. These infections can reoccur and persist for many months, resulting in communication difficulties that can persist after the disease has resolved.

In the new study, researchers retrospectively reviewed the hearing profiles of 240 patients who visited the audiology department at

Mass. Eye and Ear with either an acute or chronic conductive hearing loss but with normal sensorineural function on hearing tests.

The researchers found that patients with a longstanding moderate to moderately severe conductive hearing impairment had lower speech-recognition scores on the affected side than the healthy side, even when the speech was loud enough to be clearly audible.

Findings Further Validate Previous Study

The new study validates [previous research](#) led by Maison in adult mice in 2015, showing that longstanding conductive impairment leads to loss of the synaptic connections between the inner ear's sensory cells and the auditory nerve that relays the electrical signals to the brain.

Prior research at Mass. Eye and Ear first identified this novel type of sensorineural damage after noise exposure and dubbed it [cochlear synaptopathy, or hidden hearing loss](#).

“People with hearing loss in one ear are often reluctant to engage in rehabilitation or treatment as they still can rely on the better ear. Our study suggests that, in absence of treatment, speech perception may worsen in time. If what we have observed in mice is applicable to humans, there is a possibility that unilateral sound deprivation may affect the good ear as well.”

The findings are especially important considering that children with asymmetric hearing loss have higher rates of academic, social and behavioral difficulties, according to the authors.

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Reference:

Okada M, Welling DB, Liberman MC, Maison SF. [Chronic conductive hearing loss is associated with speech intelligibility deficits in patients with normal bone conduction thresholds.](#) *Ear and Hearing*. 2019: doi: 10.1097/AUD.0000000000000787

Source: *Ear & Hearing, Mass. Eye & Ear, Harvard Medical School*

