

Cochlear implants associated with improved voice control over time in children who are deaf

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Children with cochlear implants in both ears appear to have difficulty controlling the loudness and pitch of their voices, but these measures improve over time, according to a report in the January issue of *Archives of Otolaryngology-Head & Neck Surgery*.

"[Cochlear implants](#) provide the perception of sound through the conversion of sound stimuli into electrical impulses, which are received by the cochlear nerve and processed by the central auditory system," the authors write as background information in the article. "Although cochlear implants do not restore sound perception as experienced by an individual with normal hearing, the implant provides the user with auditory feedback in the domains of timing, intensity and frequency of sound. These auditory feedback cues may be critical for the user to monitor his or her speech production and to make purposeful moment-to-moment adjustments in voicing."

Theresa Holler, M.D., and colleagues at The Hospital for Sick [Children](#), University of Toronto, Ontario, Canada, assessed 27 children age 3 to 15 who had cochlear implants in both ears. Participating children were asked to voice the vowel "a" for three seconds at a comfortable pitch and volume. Three repetitions of this voice testing were averaged, analyzed digitally and compared with acoustic results of children who had an implant in one ear and also with norms for hearing children.

Consistent with children who had an implant in one ear, those who had implants in both ears demonstrated poorer control over the pitch and loudness of their voice than those with normal hearing. Long-term control of pitch improved as children used their hearing aids, and therefore were exposed to hearing, for more time.

"To our knowledge, this is the first study to objectively evaluate acoustic voice outcomes in children with bilateral cochlear implants and to report the influence of overall time in sound on acoustic parameters," the authors write.

"Targeted speech therapies that assist children using cochlear implants in monitoring and modifying the [pitch](#) and loudness of their voice would be useful in this setting," they conclude. "Future work is planned to develop and evaluate therapeutic tools that will specifically address these areas in implant recipients, with the objective of minimizing or eliminating these [voice](#) abnormalities."

More information: Arch Otolaryngol Head Neck Surg. 2010;136[1]:17-21.

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