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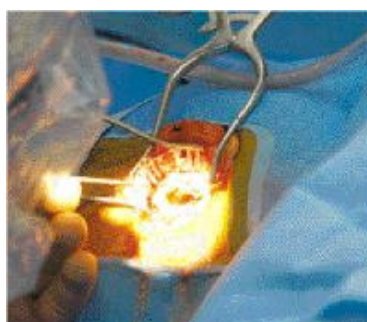
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Can You Hear Me Now?

by **JO1(SW/AW) AnTuan Guerry**
 Journal staff writer



A close-up of the cochlear implant surgery shows the incision made on the patient behind her outer ear.

In a fast-paced world full of technological advances, blink once, and you've probably missed the "next best thing." Keeping up with the constant changes could, sometimes, take calling an expert to perform even the smallest of tasks.

CDR Brian McKinnon, MC, is letting his technological expertise speak volumes to patients who, otherwise, may be sitting in a world of silence. McKinnon is assigned to National Naval Medical Center's Ear, Nose & Throat Department, but performs surgical procedures called cochlear implants at Walter Reed Army Medical Center.

A cochlear implant is a small, complex electronic device that can help provide a sense of sound to a person who is profoundly deaf or severely hard of hearing. The implant is surgically placed under the skin behind the ear. Profound hearing loss is described as 70 to 90 db or greater hearing loss, according to McKinnon who serves as chief of the otology/neurotology department at Walter Reed. Conversely, a normal hearing loss is 20 to 25 db.

"Your hearing, even if aided by a hearing aid, is better than a cochlear implant. The problem you run into is when you no longer are getting functional information from your hearing even with the assistance of a hearing aid. At that point, hearing aids can't help you and the decision is made to offer a cochlear implant," explained McKinnon, a 14-year Navy doctor.

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Varying degrees of hearing loss is based on an individual being identified as having difficulty hearing normal conversation, or if the individual is deaf, being unable to hear what is said in normal conversation at all.

According to McKinnon, there are three basic types of deafness:

Peri-natal -- which is deafness associated with being recognized at the time of birth. The deafness may have occurred before the child was born, at the time the child was born, or shortly after the child was born

Prelingual -- the loss of hearing before language is acquired, generally before ages 2-3.

Post lingual -- the loss of hearing after language is acquired, generally after ages 5-6.

Although it is difficult to obtain an accurate account of the number of deaf people in the United States, a recent study by the Survey of Income and Program Participation estimates about 8 million people as being deaf or hearing impaired, and who find it difficult to hear normal conversation.

Both children and adults can be candidates for implants, according to McKinnon. A recent Food and Drug Administration report estimated approximately 59,000 people worldwide received cochlear implants. In the United States, about 13,000 adults and 10,000 children received the implants.

Implants are designed for individuals with bilateral hearing loss who attain almost no benefit from a hearing aid. They must be 12 months of age or older unless childhood meningitis is responsible for deafness.

"Cochlear implants do not restore normal hearing, and benefits vary from one individual to another. Most users find that cochlear implants help them communicate better through improved lip reading, and over half are able to discriminate speech without the use of visual cues," said McKinnon.

Adults who have lost all or most of their hearing later in life can often benefit from cochlear implants. These older candidates can often associate the sounds made through an implant with sounds they remember. This may help them to understand speech without visual cues or systems such as lip reading or sign language.

Experts say cochlear implants, coupled with intensive post-implantation therapy, can help young children to acquire speech, language, developmental, and social skills. The best age for implantation is still being debated, but studies



have indicated the earlier implantation occurs, the better children perform.

"If you implant at 12 months, there is a very high likelihood that their learning of language will be the same as a normal child. Conversely, the longer you wait the more time it takes for the child to acquire language," he explained.

"Eighteen months to two years seems to be the point where the brain stops being plastic and starts to solidify its hard wiring. So, if we can implant at a year, or before 18 months, language takes off."

McKinnon, who has performed cochlear implants since 1998, said he has performed about 60 surgeries in that time, of which 60 percent were adults. Cochlear implants are open to all TRICARE-eligible personnel. McKinnon stressed that military members must meet the same criteria as civilian in deciding the need for implant.

A hearing aid is not a substitute for a cochlear implant and vice versa. In other words, when the hearing aid fails to provide sound functionality, the cochlear implant is viewed as a transition rather than a direct competitor.

The cochlear implant consists of two parts: the body of the implant and the electrode array. The body of the implant is surgically placed in a depression made in the mastoid bone, which sits in the temporal region of the skull behind the ear.

The body, itself, has four basic parts: a microphone, which picks up sound from the environment; a speech processor, which selects and arranges sounds picked up by the microphone and translates the sound into distinctive electrical signals; the transmitter and receiver/stimulator, which receives signals from the speech processor and converts them into electric impulses; And, electrodes, collect impulses from the stimulator and sends them to the brain where they are interpreted as meaningful sound. The electrode array is what is guided into the cochlea.

McKinnon stated post-surgery follow-up is essential in correctly mapping, or programming the implant so the patient gets the maximum information from the sound being perceived.

"What we do is 'ping' the brain to get back response and then we use that to program the device," explained McKinnon. "The patient comes back after surgery, usually in a month, and



Photos by JO1(SW/AW)
AnTuan Guerry

McKinnon talks with another doctor, who is learning how to perform the cochlear implant surgery.

the device is activated. Afterward, the patient returns for adjustments based on their perception to certain sounds."

According to McKinnon, the most important part of the entire process is the rehabilitation.

"The surgery...is not the most important thing. The most important thing is the parent and child sitting down with audiologists and teachers so that the maximum benefit for the implant is achieved," McKinnon stated.

"For three-and-a-half hours of work, I get a lot more glory than I deserve. Most of the work is not going to be done by me. Most of the work is going to be done by the family and the patients."

Humbleness aside, giving the gift of sound, for many is the "next great thing."

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