

## Cochlear Implant Surgery

When someone cannot understand what people are saying—even when using hearing aids—a cochlear implant may help.

Instead of sending louder sounds into the ear, a cochlear implant works differently. The hearing detection cells (hair cells) are damaged or missing in many people with hearing loss. Cochlear implants send sound as electric signals beyond that damaged part of the inner ear (cochlea), straight to the hearing nerve. Cochlear implants are used to help both children and adults to hear sounds and understand speech.

A cochlear implant has 2 parts: an internal receiver/stimulator (the implant itself) and an external sound processor. The external processor looks like a hearing aid but works very differently. It takes sound and turns it into electrical pulses. It connects to the receiver/stimulator by magnets. The receiver/stimulator sits underneath the skin behind the ear. It has a thin wire called an electrode. This electrode carries the electrical pulses into the cochlea, where it meets the hearing nerve.

A cochlear implant is placed with a small surgery while the patient is completely asleep (general anesthesia). During the surgery, the implant is placed under the scalp and muscle on the side of the head. The bone behind the ear (mastoid) is removed to get to the cochlea. The electrode is then inserted gently into the cochlea via a small opening. Most people do not think that cochlear implantation is a painful surgery. In fact, most people can go home from the hospital the same day.

Once the surgery is over, the ear is allowed to heal for 2 to 4 weeks. The cochlear implant is not on yet. Once the wound is healed, the patient meets with a specialized audiologist who will set up the implant for the first time. This is called activation. After activation, the person will listen through the implant. The patient will meet with the audiologist 6 to 9 times during the first year after surgery. These appointments are used to fine tune the hearing through the implant.

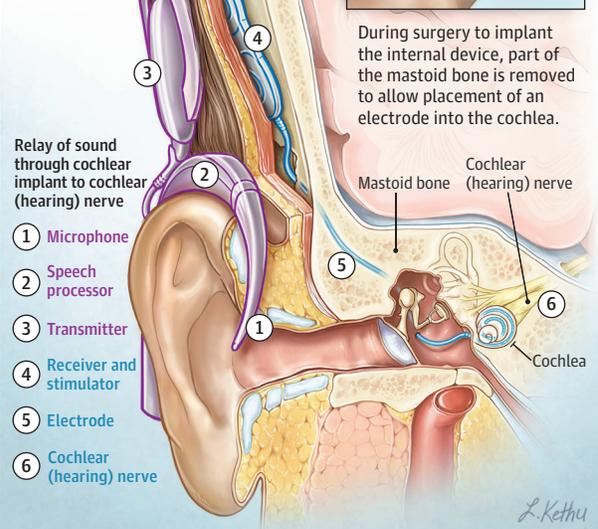
It is important to know that the hearing provided by the implant is not normal hearing. For many people, the sound is not clear right after activation. Hearing with a cochlear implant takes time because the brain must learn how to understand this new type of sound. The patient needs to practice listening, which is called aural rehabilitation. Implant users and their families may be taught to do ex-

### Cochlear Implants and How They Work

A cochlear implant consists of 2 parts connected via magnets.

An **internal device** with a receiver and stimulator is surgically placed under the scalp and muscle behind the ear.

An **external processor** with a microphone, speech processor, and transmitter is worn around the ear.



ercises online and/or meet with a speech-language therapist. With practice and daily listening, the sounds and words become clearer over a 3- to 9-month period.

#### FOR MORE INFORMATION

Cochlear Implants

<https://www.nidcd.nih.gov/health/cochlear-implants>

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