

# Cochlear Implants

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As one of the most cost effective medical procedures, cochlear implants, sometimes called bionic ears, are surgically implanted devices used by people who have experienced severe hearing loss due to problems with their inner ear, or cochlea.

A cochlea is a spiral shaped tube in your ear. It is where the nerves in your ear are contained. The cochlea gathers electrical signals from sound vibrations transmitted from your eardrum and middle ear and transmits them to your auditory nerve, where the signal is sent to your brain.

If part of the cochlea isn't working right, then the auditory nerve won't be stimulated and electrical signals will not reach the brain. This is called sensorineural hearing loss. When this happens, hearing does not occur. A cochlear implant works by completely bypassing the damaged cochlea, using its own electrical signals to stimulate the auditory nerve, which allows the person to hear.

A cochlear implant consists of an implant package and a sound and speech processor. The implant package, which is implanted inside the skull, consists of a receiver-stimulator that controls the flow of electrical pulses in the ear, an antenna that receives signals from the processor, a magnet that holds the processor in place, and a wire containing electrodes that is inserted into the cochlea.

The sound and speech processor converts sound into digital signals, then sends them to the implant package as electrical signals. This is worn externally and looks similar to a hearing aid.

The surgery takes 2-4 hours and they use anesthesia. The process involves inserting and securing the implant package inside the skull and threading the wires containing the electrode into the cochlea.



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