

Cochlear Implants

Navigating a Forest of Information...One Tree at a Time

<http://clerccenter2.gallaudet.edu/KidsWorldDeafNet/e-docs/CI/index.html>

by [Debra Nussbaum](#), M.A., CCC-A/March 2003

Laurent Clerc National Deaf Education Center
Gallaudet University

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What is a Cochlear Implant?

A cochlear implant is a technological device intended to enhance the hearing of persons who are deaf. There are more than 70,000 people (as of fall 2005) with cochlear implants worldwide—and about half are children. Experience and research suggest that a cochlear implant can bring a greater awareness to a broader range of sounds for many deaf children in comparison to traditional hearing aids. Use of this device requires participation in an often rigorous pre-implantation protocol to determine [candidacy](#), [surgery](#) to implant a portion of the device, an activation process to program an externally worn portion of the device, and participation in an intensive auditory training program, as well as an appropriate [educational program](#) to actualize benefit from the device.

There are three manufacturers of cochlear implants commonly used in the United States. Each of these manufacturers provides extensive (promotional) resources at no charge about their specific brand of cochlear implant, as well as general information about implants. (See the contact information for each of the manufacturers in the [Resources](#) section.)

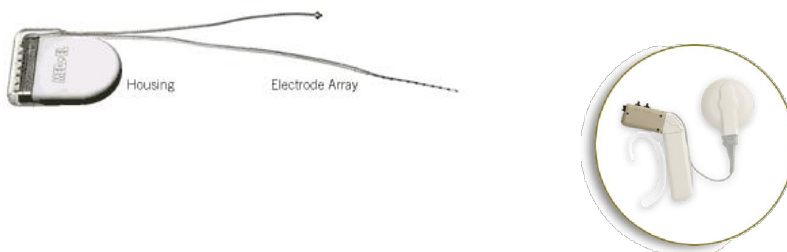
- [Advanced Bionics Corporation](#) is the manufacturer of the body-worn Platinum Sound Processor and HiRes AURIA behind-the-ear device. Older generation devices include the CII BTE™ and Platinum BTE.™



- [Cochlear Corporation](#) is the manufacturer of the Nucleus[®] Freedom[™] body-worn and ear-level devices. Older generations of the device include the Spectra and Sprint body-worn processors and the Esprit and 3G BTE processors.



- [MED-EL Corporation](#) is the manufacturer of the TEMPO+ speech processor which provides a total of five wearing options. It has a modular design and four available battery packs.



Components of the Device

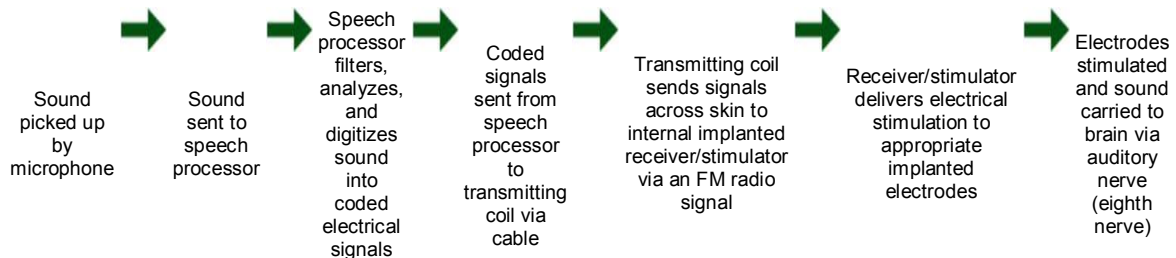
A cochlear implant is comprised of surgically implanted and externally worn components. The surgically implanted components include:

- a **receiver/stimulator** housed in a bio-compatible case, which is surgically implanted under the skin behind the ear, and contains a magnet, which couples to the magnet in the transmitter worn externally; and
- an **electrode array** inserted into the cochlea to provide direct electrical stimulation to remaining nerve fibers.

The externally worn, non-implanted components of the device include:

- a **microphone** similar to the microphone of a hearing aid,
- a **speech processor** that can be worn on the body (pager style, connected to the headpiece by a cable) or behind the ear (similar to a hearing aid), and
- a **transmitting coil**, a small disk about the size of a quarter, which adheres to the skin behind the ear via a magnet and is connected to the microphone by a small cable.

How a Cochlear Implant Works



For more information about how a cochlear implant works, see:

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[MED-EL: How a Cochlear Implant Works](#)

Advanced Bionics: [How Implants Work](#) and [Bionic Ear Informational Videos](#)

[Cochlear Americas: How Cochlear Implants Work](#)

For More Information

While it is unknown how any one person perceives sound through a cochlear implant, the following Web site provides sound simulations that approximate this experience:

<http://www.utdallas.edu/~loizou/cimplants/tutorial/>

Fact Sheets describing the basic components of a cochlear implant can be found at the following Web sites:

[The Alexander Graham Bell Association for the Deaf and Hard of Hearing \(AG Bell\)](#)

[AG Bell: Kids and Cochlear Implants: Getting Connected \(PDF\)](#)

[The American Speech-Language-Hearing Association \(ASHA\)](#)

[The Cochlear Implant Association, Inc. \(CIAI\)](#)

[Educational Resources Information Center \(ERIC\): Educating Children Who Are Deaf or Hard of Hearing: Cochlear Implants](#)

[The National Institute on Deafness and Other Communication Disorders \(NIDCD\)](#)

[U.S. Food and Drug Administration: Cochlear Implants](#)

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