

**Cochlear Implants:** Adapted from Boys Town National Research Hospital and Clerc Center's Cochlear Implants; Navigating a Forest of Information.

The cochlear implant is a surgically implanted device that transmits electrical stimulation within the inner ear. It is used to provide access to sound to profoundly deaf children. The cochlear implant has both internal (implanted) and external (worn outside the body) parts. An external microphone (usually mounted on a small headpiece worn at ear level) picks up speech and other sounds in the environment. This sound is then converted into electrical signals by a sophisticated processing unit (worn outside the body). The electrical signals are transmitted through the skin to an internal receiver. They are then sent to an array of electrodes implanted in the cochlea (inner ear) to stimulate the remaining nerve fibers. The signals are sent to the brain where they are interpreted as sound. Once the implant site has healed, the device requires programming or "fine-tuning" (also referred to as mapping) to meet the auditory needs of the child. The cochlear implant differs from a hearing aid in that it does not make sounds louder. It converts sound energy into electrical signals and stimulates the auditory nerve.

A cochlear implant ***does not provide the user with normal hearing***. It does provide an awareness of environmental sounds and some speech signal information. The benefits of the cochlear implant vary from child to child and depend on factors such as age at onset of deafness, age at implant surgery, condition of the cochlea, and the child's unique needs.

Children with implants must receive intensive and ongoing therapy in order to maximize the use and potential of the cochlear implant. This generally involves auditory training several times a week. It does not eliminate the need for a specialized educational program for the child. Each child's progress and amount of benefit will vary. ***Quality post-implant training and support is essential.***

### **Candidacy:**

A variety of requirements are considered for children in determining candidacy for a cochlear implant. The FDA recommended age requirement is 12 months, though specific circumstances may allow for earlier implantation.

Family involvement must be evaluated during the candidacy process. Families' understanding and expectations of the implant must be carefully determined to ensure that each child is an appropriate candidate.

## **Surgery:**

Surgery for a cochlear implant is usually on an outpatient basis, is completed under general anesthesia, and lasts about three hours. The stitches are removed about two weeks after surgery. The patient usually returns to school within a week of surgery. The implant is activated four to six weeks after implantation, allowing enough time for the incision to heal properly.

## **Associated Risks:**

- The greatest risks are those related to the general anesthesia.
- As the surgery is performed in the vicinity of the nerve that moves the face, there is the rare possibility that temporary or permanent facial paralysis may occur.
- The surgical site could possibly become infected, requiring removal of the device.
- The site could become visibly red or might emit fluid, necessitating immediate examination by the surgeon.
- There may be pain at the wound following surgery—this is typically temporary.
- There is a slight risk of taste disturbances, such as having a metallic taste.
- Residual hearing in the implanted ear will most likely be lost (although with improvements in the technology and surgical procedures, this is not always the case).
- Following surgery, dizziness is sometimes noted.
- The FDA has posted a notice related to a possible association between cochlear implants and meningitis.
- Since the devices have been in use for a relatively short time, parents are **urged** to stay abreast of new developments or knowledge related to long-term safety.

A cochlear implant procedure includes surgery, habilitation, maintenance (battery, accessories, insurance) and can be expensive. It is a long-term commitment. Post-implant care will require an ongoing coordination between the implant center, the child's family, and educational service providers. Families must be aware of their responsibility and role in supporting their children's implant.

###

Parent Links: Hope! Dream! Achieve! Is a program of the California Department of Education funded by a federal Maternal and Child Health Bureau grant.

The Parent Links name and materials are used with permission of the Coalition of Agencies Serving the Deaf and Hard of Hearing, Inc.

*This information is public domain unless otherwise stated. Readers are encouraged to copy and share it, but please credit the Parent Links program and the source.*