



## Appendix B

# Cochlear implants and hearing

People are able to hear sounds because a part of the inner ear called the “cochlea” sends signals about sound to the brain. If a person’s cochlea is damaged or did not develop in the usual way, he will not be able to hear well. Even hearing aids may not be much help to this person.

A cochlear implant is a small piece of equipment that can help some deaf people, including some people with damaged cochleas, hear sounds and understand speech. Though they are very expensive, cochlear implants are now available in many countries.



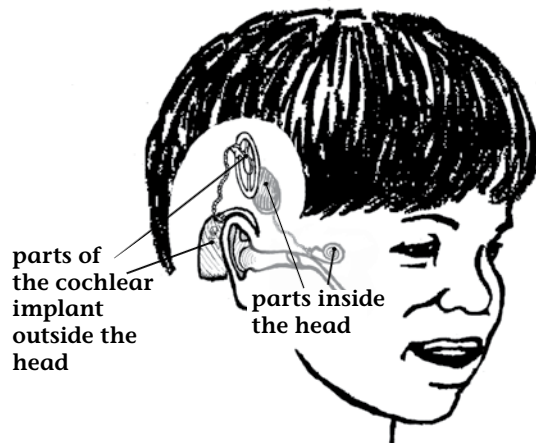
cochlea

The cochlea is a small part of the ear inside the head. It is shaped like a snail’s shell.

### Parts of a cochlear implant

Part of the cochlear implant is worn outside the head like a hearing aid. And like a hearing aid, this part has a microphone that picks up sound from a person’s environment.

Other parts of the cochlear implant are inside the head. These parts receive sound information, change it to electrical signals, and send those signals to the brain. These parts of the cochlear implant are placed during an operation.



parts of the cochlear implant outside the head

parts inside the head

## Who can be helped by a cochlear implant?

Cochlear implants are helpful only to people who are completely deaf or have very little hearing even with a hearing aid. In some countries, babies as young as 6 months can get cochlear implants. In other places they must be 1 to 2 years old. Cochlear implants do not help people who already have some hearing.

## Effect of cochlear implants on hearing

Cochlear implants can help people with severe hearing loss hear sounds, understand speech, and have a better quality of life. And they do not make someone's hearing the same as a person without hearing loss. Even when cochlear implants work well, hearing through an implant will sound different from "typical" hearing.

After a person receives a cochlear implant, it is adjusted over time to meet their needs. The person must also "train" their brain (with support from health workers) to understand the information it receives from the implant. This takes time and practice, and helps people with implants to recognize sounds, understand speech, and have conversations with others.

This child with a cochlear implant can hear the voices of her family members. She has to learn the difference between each person's voice.



The results of a cochlear implant can be very different for each person. This depends on the cause of someone's hearing loss, how old they are when they get an implant, how much hearing and speech they had before, how frequently they wear their implant, and whether they get good training after getting an implant.

Most children who have a cochlear implant, use it frequently (wearing the external part all the time when awake), and who have good, consistent training will hear loud and quiet sounds and be able to tell the difference between people's voices. Some will also learn to speak. Others may still have difficulty hearing and learning to talk.

## Is a cochlear implant a good choice for your family?

If you are trying to decide whether a cochlear implant is a reasonable choice for your child, here are some things to consider.

## ARE COCHLEAR IMPLANTS AND PROFESSIONAL SUPPORT AVAILABLE IN YOUR AREA?

Many communities do not have doctors or professionals who are trained to work with children who have cochlear implants. Most countries have some doctors who can perform the operation, but they are usually in big city hospitals where there may also be a cochlear implant center.

Having a cochlear implant center near you is important. You and your child will visit the center many times for several years after your child is implanted. Your Ministry of Health or a school for the deaf might be able to tell you if there is a cochlear implant center close to you.

## COST OF THE OPERATION AND COCHLEAR IMPLANT

The operation, equipment, and years of training with professionals are very expensive. As with hearing aids, children can lose or break parts that are worn outside the head. These parts can be very expensive to replace.

**In many countries, the cost of a cochlear implant operation, equipment, and training costs many years of a person's salary.**



Older and cheaper cochlear implants do not work as well as the newer, more expensive equipment. In a few countries, programs offer the cochlear implant for free or at low cost.

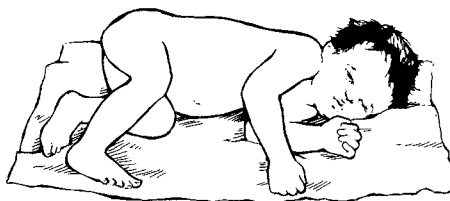
Cochlear implants, like other kinds of health care, should not be given only to those who are rich enough to afford them. If a cochlear implant is the best thing for a child, the equipment, operation, and support should be made available.



### Cochlear implants and illness

Sometimes the cochlear implant can cause ear infections that can make hearing worse. It is important to treat ear infections quickly in children who have cochlear implants. It is also important to vaccinate them against childhood illness.

Children who have cochlear implants are also more likely to develop meningitis, a very serious infection of the brain. Meningitis is also more likely in children who:

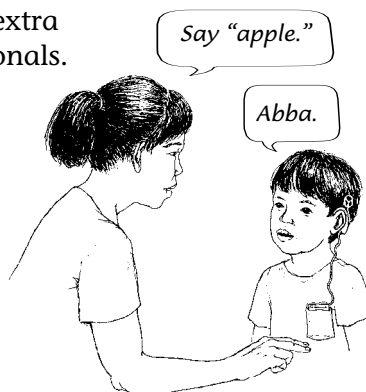


- have weakened immune systems (for example, due to HIV).
- have recently had an infection of the ears or respiratory system.
- live in a place where many people have meningitis (for example, some countries in Africa).

For more information about meningitis, see page 201, as well as the book *Where There Is No Doctor*, published by Hesperian Health Guides.

## CARE AND SUPPORT AFTER THE OPERATION

Young children with a cochlear implant need extra care and help from their families and professionals. After children heal from the operation, they must spend years training with professionals to learn to hear and to understand the sounds they hear. The family will also need training in how to communicate with the child.



### Cochlear implants and sign language

Children with cochlear implants can benefit from using sign language. Sign language can be an important language foundation for young children who are waiting to get a cochlear implant and a supportive communication tool for older children who already have an implant. There is no reason why children with cochlear implants cannot use sign language while they are learning to listen and speak.