



## Appendix B

# Cochlear implants and hearing

People are able to hear sounds because a part of the ear called the 'cochlea' sends signals about sound to the brain. If a person's cochlea is damaged, he will not be able to hear well.

A cochlear implant operation is a new way to help some deaf children hear sound. Though it is very expensive, this operation is now available in many countries.

To give someone an 'artificial cochlea', the bones of his head must be cut open in an operation. A small piece of equipment called a 'cochlear implant' is inserted inside the innermost part of the ear.

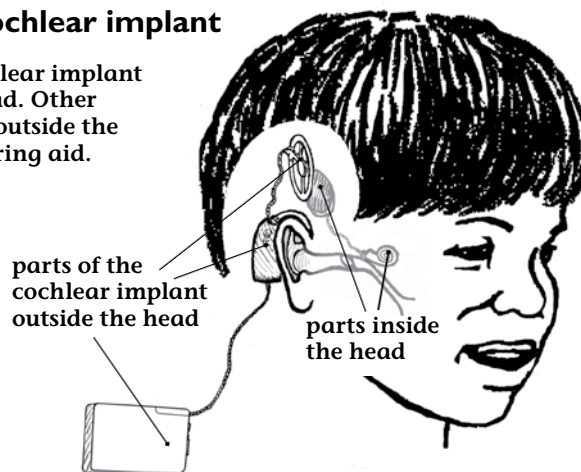
### the inside of the ear



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 inside the head. Other parts are worn outside the head like a hearing aid.



## Who can be helped by a cochlear implant?

The cochlear implant is only given to children 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 implant on hearing

Cochlear implants do not restore hearing. People who receive cochlear implants will still be deaf. The implant's outside microphone and processor send signals to the implant which passes them to the brain. The outside parts are tuned over a period of time to meet each child's needs.

Your child must use the cochlear implant correctly to be able to hear sounds. Even when cochlear implants work well, hearing through an implant sounds different from normal hearing. Some people say that sounds seem flat or 'tinny' — they compare it to listening to a radio station that does not come in clearly. It takes some time and practice for children with cochlear implants to learn to understand the sounds they hear. Children must go to classes to be trained in how to 'hear' with the cochlear implant.

**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 the operation, equipment, and training classes are very different for each child. Most children who have a cochlear implant and use it correctly, and who have very good training, will hear and understand sounds. Some children who get cochlear implants will also learn to speak. Other children who have good training and use the cochlear implant correctly 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.

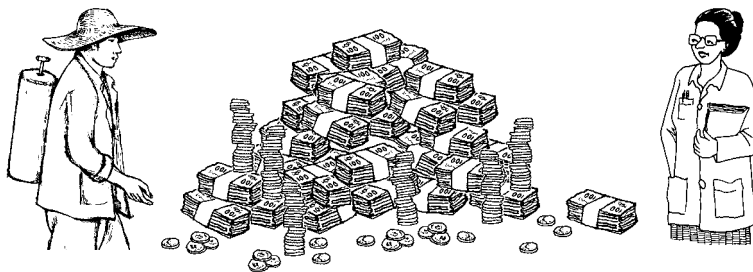
Having a cochlear implant center near you is important. You and your child will visit the center many times for several years after your child is implanted. Your Ministry of Health or a school for the deaf might be able to tell you if there is a cochlear implant center close to you.

### COST OF THE OPERATION AND COCHLEAR IMPLANT

The operation, equipment, and years of training with professionals are very expensive. In India, cochlear implants can cost about \$10,000. (Hearing aids cost about \$75.) 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 China, the operation, equipment, and training equals 20 years of an average worker's salary.

In Mexico, the cost of a cochlear implant equals 4 years of a medical doctor'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.

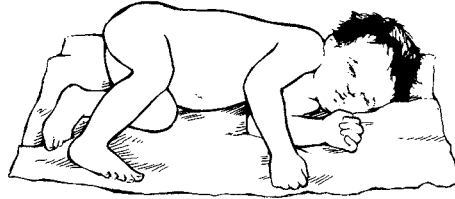
Cochlear implants, like other kinds of health care, should not only be given to those who are rich enough to afford them. If a cochlear implant is the best thing for a child, the operation and support should be made available.



### 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.

The cochlear implant equipment and operation can also cause a serious illness called meningitis, even years later. Meningitis is a very serious infection of the brain and can happen more in children who:

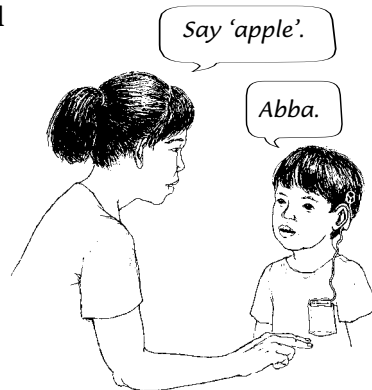


- are younger than 5 years old.
- became deaf because of meningitis.
- have ear infections.
- get sick often.

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 may benefit from learning to sign. There is no reason why children with cochlear implants cannot use sign language while they are learning to listen and speak.