



[This page prints out on 5 sheets]

Cochlear Implants

Read this section to learn about cochlear implants.

If you're thinking about getting a cochlear implant for your child, learn the basics about CIs on this page. Or go to our [Cochlear Implants FAQ](http://www.raisingdeafkids.org/help/tech/ci/faq.jsp) (<http://www.raisingdeafkids.org/help/tech/ci/faq.jsp>) page to learn more.

What a cochlear implant is

A cochlear implant is a device that helps some deaf people hear.

A surgeon puts part of the implant under the skin behind the ear and inside the inner ear. The implant has four parts:

- The **headpiece** is worn behind the ear. Magnets hold it in place over the parts that are under the skin. It has a microphone that picks up sounds from the environment. A transmitter sends the sounds to the speech processor.
- The **speech processor** is worn on the body. It takes sounds from the transmitter and changes them into electrical signals. Then it sends the signals to the receiver.
- The **receiver** is placed under the skin behind one ear. A wire from the receiver goes to the electrodes.
- A doctor puts the **electrodes** in the cochlea. The electrodes take signals from the receiver and send them to the brain.



[See how a cochlear implant works](http://www.pbs.org/wnet/soundandfury/cochlear/cochlear_flash.html)

(http://www.pbs.org/wnet/soundandfury/cochlear/cochlear_flash.html) at the Sound and Fury website.

Who can get a cochlear implant

Children and adults can get implants. Your child may be able to get an implant if he:

- is older than 1 year old. Some implant centers only do implants on children older than 18 months or 2 years. In some cases, children get implants even before they are 1 year old. But this is not common.
- has a severe or profound sensorineural hearing loss (nerve deafness) in both ears
- can't hear very much even with hearing aids
- has no other medical problems that might make the surgery risky
- has a family that is willing to work hard to help him learn to listen and speak

How a cochlear implant can help your child

With a cochlear implant, your child will probably be able to hear more sounds. Many children learn to speak and understand speech very clearly. Those children who can't may still be able to hear more than with hearing aids. How much the implant helps your child depends on a few things:

- How old your child was when he became deaf. If he was born deaf, it may take longer for him to learn what different sounds mean.
- How old your child is when he gets the implant. Younger children tend to have better hearing and speech after getting a cochlear implant. Older children can also be helped by a cochlear implant.
- How well your child's auditory nerve (hearing nerve) works
- How much your child uses the implant and works on trying to hear and understand speech
- How much help your child gets from you and his teachers and therapists
- Whether your child has any problems with learning

The risks of getting a cochlear implant

Like any surgery, there are risks that you should know about.

Keep in mind that most of these operations do not have problems. Your doctor should explain all of the risks to you. Ask questions until you understand them well:

- Your child will need **general anesthesia** so he can sleep during the operation. Ask your doctor about the risks of general anesthesia.
- Any surgery has a risk of bleeding or infection. With cochlear implant surgery, there is also a risk of dizziness. The nerves in the face could also be damaged.
- Your child may have a slightly higher risk of getting a serious infection called **meningitis**. The risk is still very small.
Read more about this [risk](http://www.fda.gov/cdrh/safety/cochlear.html) (<http://www.fda.gov/cdrh/safety/cochlear.html>) at the FDA website.

Should your child get a cochlear implant?

Getting a cochlear implant is a big step. Learn everything you can about cochlear implants. Talk to other people about implants:

- Talk to the cochlear implant team about how it will help your child. If there is more than 1 implant center near you, talk to both of them. Read about [choosing an implant center](http://www.cici.org/select.html) (<http://www.cici.org/select.html>).
- Talk to other parents of children who have gotten cochlear implants about their experiences.
- Talk to other deaf people about cochlear implants.

Think about what your goals are for your child. Ask yourself how you think a cochlear implant will help your child reach those goals.

Learn more about different views on cochlear implants

- Read the American Society for Deaf Children's (ASDC) [views on cochlear implants](http://www.deafchildren.org/resources/snapshots/snapshot_CI.pdf) (http://www.deafchildren.org/resources/snapshots/snapshot_CI.pdf).
- Read the National Association of the Deaf's (NAD) [position on cochlear implants](http://www.nad.org/infocenter/newsroom/positions/CochlearImplants.html) (<http://www.nad.org/infocenter/newsroom/positions/CochlearImplants.html>).

Where to go for the cochlear implant

Ask your audiologist or family doctor to refer you to an implant center. An **otolaryngologist** (ENT or ear, nose and throat doctor) will be the doctor who does the surgery. Most ENTs work with an implant team. The people on the team will evaluate your child and family to see if a cochlear implant is a good choice. Here's a list of people who may be on the team:

- An **audiologist** will test your child's hearing with and without hearing aids
- A **speech and language pathologist** will test your child's language skills
- An **otolaryngologist** will check to see if your child has an infection or other problem that would interfere with the implant. The doctor may order an **MRI** or **CT scan** to look at the structure of the inner ear.
- A **teacher of the deaf** or educational consultant will tell you about educational programs for your child.
- A **social worker** will talk to you about whether your family is able to do the work that is needed. The social worker may also help you figure out who will pay for the implant.
- A **psychologist** will talk to you and your child about your goals, concerns and fears about cochlear implantation

On the day of the surgery

The operation usually takes about 2 to 3 hours. At some centers, your child will need to stay in the hospital for a day or two. But some centers do the surgery on an outpatient basis. This means you go home on the same day as the operation.

Here's what happens during the operation:

1. The surgeon cuts through the skin behind the ear and drills away part of the bone. This lets him get to the inner ear.
2. He makes a small opening and threads the electrodes into the cochlea.
3. Then he connects the outer end of the electrodes and the receiver to the bone.
4. He closes up the opening and bandages the head.

After surgery

After your child's surgery, you will go home and wait for about a month. While your child's head heals, you might want to read more about what will happen next.

- **Initial switch-on**
Today is the big day. Your audiologist is going to connect all the parts of the implant. Then she will use a computer to start turning on the electrodes. She turns them on one at a time. She tries to find the lowest amount of electricity that your child responds to. This is called the T-level, or threshold level. Then she finds out how high she can go and it will still be comfortable. This is the C-level
- **The MAP**
After she finds these levels, the computer makes a MAP, which records the levels for each electrode. This MAP is stored on a computer chip in the speech processor. Now your child can try listening to speech. Some children don't seem to notice the sound. Other children will react right away. Sometimes a child will cry. This might be because she is scared by the new sounds.
- **Adjusting the settings**
Over the next few weeks the audiologist will check and adjust the settings. She will try to find the level that lets your child hear speech sounds but is not too loud. After the first month or so, she will want to see your child about once a month. A few months later, she may tell you that she only needs to see your child about 3 or 4 times a year.
- **Hearing therapy**
As soon as your child starts to hear sounds from the implant, he will need to start learning what those sounds are. Your child may need hearing therapy for several years.
- **Yearly check-ups**
About once a year, your audiologist will probably want to see your child. She will check to see that the implant is working and make any adjustments that are needed.

How to get help to pay for a cochlear implant

Cochlear implants are expensive. With all the testing and therapy required, the total cost may be around \$40,000. Most insurance companies cover the cost of cochlear implantation. Medicaid will also pay for a cochlear implant. Call your insurance company to find out if it covers cochlear implants.

Learn more about cochlear implants

- Read what [parents say about cochlear implants](http://www.raisingdeafkids.org/meet/parents/ci.jsp) (<http://www.raisingdeafkids.org/meet/parents/ci.jsp>).
- Read "The Parents' Guide to Cochlear Implants," by Patricia M. Chute and Mary Ellen Nevins. This book has lots of information about getting and living with a cochlear implant.
- Another great resource is [Navigating a Forest of Information...One Tree at a Time](http://clerccenter2.gallaudet.edu/KidsWorldDeafNet/e-docs/CI/index.html) (<http://clerccenter2.gallaudet.edu/KidsWorldDeafNet/e-docs/CI/index.html>) by Debra Nussbaum.
- Visit the [Cochlear Implant Association's](http://www.cici.org/) (<http://www.cici.org/>) website.
- Check out the [Listen-Up website](http://www.listen-up.org/implant.htm) (<http://www.listen-up.org/implant.htm>). This website has lots of links to information about cochlear implants.
- Go to the [Sound and Fury website](http://www.pbs.org/wnet/soundandfury/cochlear/) (<http://www.pbs.org/wnet/soundandfury/cochlear/>). Sound and Fury is a movie made about one family's decision about cochlear implantation.
- Visit [The Children's Hearing Institute](http://www.childrenshearinginstitute.org/) website. This website has a list of organizations, other websites, educational resources and other information about cochlear implants and hearing loss.

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You can find this page online at:
<http://www.raisingdeafkids.org/help/tech/ci/>