



**NATIONWIDE CHILDREN'S**  
*When your child needs a hospital, everything matters.*

**Helping Hand™**

*Health Education for Patients and Families*

## Getting a Cochlear Implant

A cochlear (KOE-klee-er) implant is a device worn on the outside of the ear. It is for people with more severe hearing losses. It takes sounds from the environment, turns them into electrical signals, and sends them to the brain.

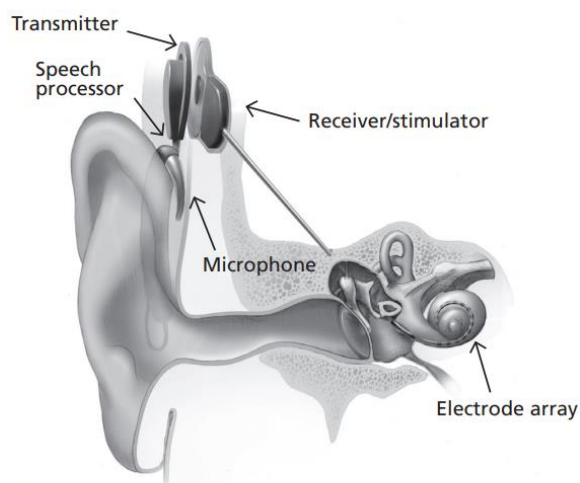
Cochlear implants are different than hearing aids. Hearing aids only make sounds louder, and use the hearing cells in the cochlea. Cochlear implants, however, bypass the hearing cells and send signals through the hearing nerve.

The implant does not bring back normal hearing. Depending on your child's type of hearing loss, they may need one implant (unilateral) or two (bilateral). Hearing with a cochlear implant is different than normal hearing. It will take time for your child to learn how to hear with an implant.

### How it works

The implant has two pieces (Picture 1). One piece is implanted inside the ear with surgery. The other piece is worn outside the ear. There are important pieces of a cochlear implant that will help your child hear:

- There is a **microphone** on the outside part of the implant. It helps pick up sounds.
- Also on the outside of the implant is a **speech processor**. It takes the sounds your child hears and turns them into electrical signals. This is called coding.
- The inside part of the implant has a **receiver and stimulator**. These send electrical signals to the cochlea. The cochlea is a snail-shaped bone in the inner ear that sends the signals to the brain to tell us what a sound means.



Source: NIH/NIDCD

**Picture 1** Ear with cochlear implant.

## Hearing test

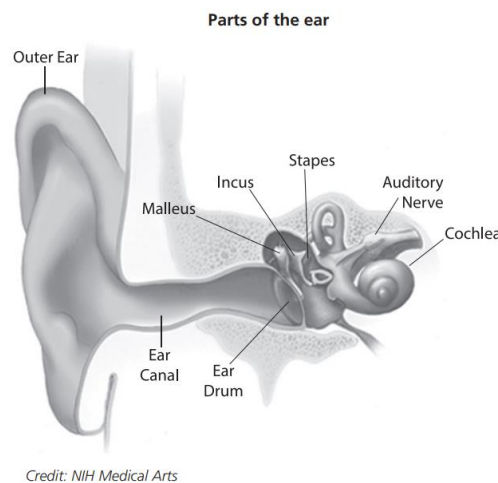
Your child's hearing will be tested and then measured on a scale of decibels (dB). It is compared to normal hearing, which is less than 25dB. You will get their results in a graph that shows the results of their hearing test. This is called an audiogram.

Decibel level	Things your child might not hear
Mild: 26 to 40dB	whisper, ticking watch, refrigerator hum
Moderate: 41 to 55dB	rain storm, coffee brewing
Moderately severe: 56 to 70dB	normal speech, phone ring, washing machine
Severe: 71 to 90dB	school cafeteria, lawnmower, leaf blower
Profound: 90+dB	motorcycle, sirens, fire crackers, nearby thunder

## What to know

Listed below are some important pieces of information about cochlear implants in children.

- Children may get implants as early as **9 months** of age. Younger children are often able to learn how to hear with the implant quickly.
- Surgery can be considered if severe hearing loss affects 1 or both ears.
- Each ear is considered separately for cochlear implants. Surgery can be done for both at the same time if both ears are candidates.
- Implants are considered if an ear cannot hear well with the correct use of hearing aids.
- Some rare anatomic conditions can keep the cochlear implant from working. Some examples include not having an auditory nerve or a normally shaped cochlea (Picture 2).
- Spoken language develops best in children with implants who sign up for an early intervention program that focuses on listening and speaking skills. Our program has listening and speech experts that will assess your child and help them develop communication to the highest of their ability.



**Picture 2** Inside view of the ear showing the auditory nerve.

## Evaluations and consultations

If your child is a candidate to get a cochlear implant, they will be evaluated to make sure the implant is right for them. The implant team will help you arrange the evaluations they need.

Evaluation type	What is done
Medical	<ul style="list-style-type: none"><li>• Review of your child’s medical and family history.</li><li>• Full medical exam with focus on their head, neck, ears, and face.</li><li>• A MRI and sometimes a CT scan are done to see deep inside your child’s ear(s).</li><li>• Other tests (such as virus or genetic tests) may be ordered to see if anything would keep the surgery from happening.</li></ul>
Audiological	<ul style="list-style-type: none"><li>• Review of your child’s hearing history.</li><li>• Check how well their hearing aids are working.</li><li>• Test your child’s hearing level two ways – (1) with hearing aids on, (2) with hearing aids off.</li></ul>
Speech and language	<ul style="list-style-type: none"><li>• A speech-language pathologist (therapist) will test how well hearing aids work for your child by testing:<ul style="list-style-type: none"><li>– listening skills</li><li>– sign language</li><li>– speech and understanding of words</li><li>– pronunciation – how well they can say parts of a word</li></ul></li></ul>
Social work	<ul style="list-style-type: none"><li>• A social worker may see how well your child and family are functioning after surgery.</li><li>• Can help with insurance or transportation for appointments.</li></ul>
Education and therapy	<ul style="list-style-type: none"><li>• The medical team will meet with your child’s teacher, speech therapist, and early intervention specialists.</li><li>• They will discuss your child’s eligibility for a cochlear implant based on their evaluations.</li></ul>

## More information

- After evaluations are complete, the implant team will meet to decide if a cochlear implant is right for your child. Once a decision has been made, you will be contacted.
- Once your child gets approved by the implant team and your insurance provider, you will be contacted to schedule the surgery.
- After surgery, your child will get cochlear implant adjustments and upgrades for life.

For questions about cochlear implants, contact ENT at (614) 722-6547.