



Understanding Cochlear Implants

At Sanford Health, our cochlear implant team cares for patients of all ages. Our team is committed to giving the highest quality care and meeting the needs of each patient. We will monitor your progress so you can have the best results possible.

What is a Cochlear Implant?

A cochlear implant is an electronic device that is put in during surgery. It can improve severe hearing loss caused by damage to the inner ear (cochlea). Hearing aids are no longer helping. Hearing loss can be present at birth or occur later. It can be caused by:

- Noise exposure
- Aging
- Infection
- Genetics

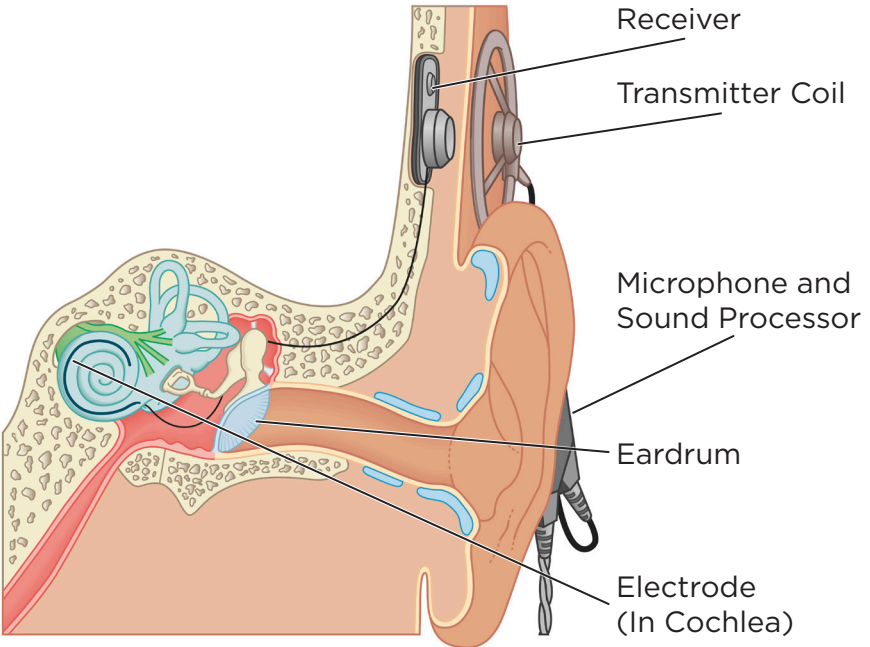
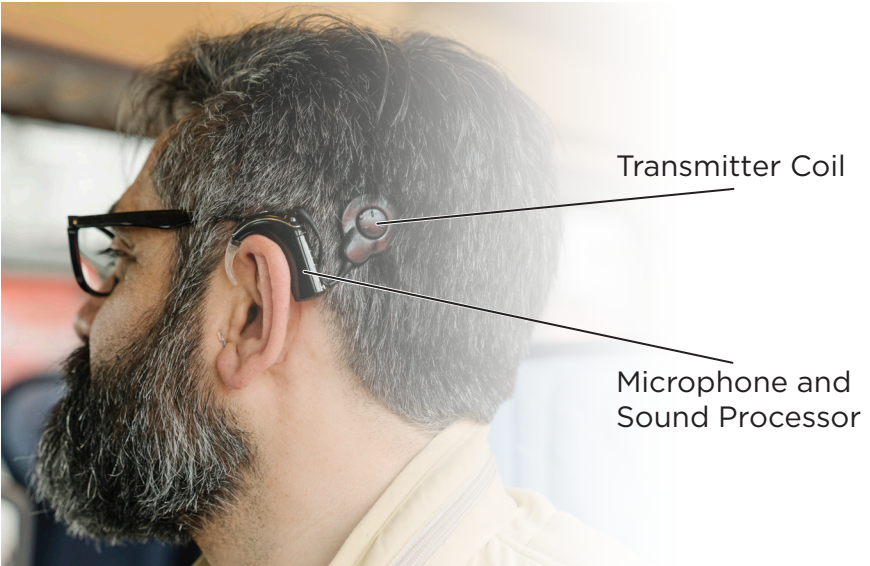
There are two parts to the cochlear implant:

Internal device – A receiver is put under the skin during surgery and the electrode placed in the cochlea. The receiver will bypass the sensory hair cells in the cochlea and stimulate the nerve.

External processor – A microphone, sound processor and coil are worn outside the head.

The sound processor sits on top of the ear (like a hearing aid) with the help of an ear hook. At the end of the cable is a coil with a small magnet attached. There is also a small magnet on the receiver. The magnets help hold the sound processor in place. You can also use a hearing aid ear mold to keep the sound processor in place. In some children, the sound processor may be worn on their clothes instead of over the ear.

Placement of Cochlear Implant



Who May Have a Cochlear Implant?

You must be in good health for surgery. You will be asked to see your regular doctor for a full history and exam.

Children

- Over 12 months old with profound hearing loss
- Over 24 months with severe to profound hearing loss in both ears caused by damage to the inner ear
- Use of correctly fit hearing aids for at least 6 months
- Work with early intervention services through NDSD Parent Infant Program
- Lack of language development
- No reasons that the surgery cannot be done (contraindications)
- The parents and child (if able):
 - Know what to expect
 - Want to have the surgery
 - Agree to the follow-up care

Adults

- 18 years and older – there is no age limit for a cochlear implant
- Severe hearing loss in both ears caused by damage to the inner ear (cochlea)
- Little success from correctly fit hearing aids
- No reasons that the surgery cannot be done (contraindications)
- The patient knows:
 - What to expect
 - Wants to have the surgery
 - Agrees to the follow-up care

Before Surgery

You will need several visits to the audiologist and the surgeon before having a cochlear implant.

Audiology Appointment

- History of your hearing problem
- Full hearing exam
 - Shows the type of your hearing loss and how bad it is
- Full hearing aid evaluation
 - Ensures your hearing aid settings are the best settings for you
- Aided speech perception assessment
 - Shows how well you hear and understand speech when using your hearing aids
- Talk about the cochlear implant process, equipment, and what to expect

Medical Appointment

- Health history, exam and tests. For some patients coming from a distance, testing may be done closer to home if available.
- MRI of brain and/or CT of temporal bone
 - To make sure the nerves and cochlea needed for the implant are present and intact
 - To make sure you have no other issues that would affect the surgery or its result
- Videonystagmography (VNG) balance test may be needed if you are 18 years or older
 - To show how well you are able to keep your balance (The hearing and balance centers are closely linked.)
- Talk about test results and decide if the surgery may be right for you
- Pneumococcal vaccine (Pneumovax or Prevnar 13 depending on vaccination history) is recommended to prevent meningitis.

Speech and Language Therapy Appointment

Before surgery, you will see a speech and language therapist with experience in hearing disorders. The therapist will answer any questions you may have about their role. They will also tell you how speech therapy can help during the cochlear implant process. At this visit you will:

- Talk about your health, speech, language and use of hearing aid device history
- Look at your ability to understand what is said and your ability to speak and express yourself
- Talk about how you manage your hearing loss at home



Working Together

The cochlear implant team includes the surgeon, audiologists, speech and language therapists and your family. For children, this team may also include:

- A pediatrician
- School employees
- Early intervention
- The school for the deaf

For adults, it may include the primary doctor or other care providers. The team will communicate before a decision is made to have surgery and after the cochlear implant surgery. Common goals will make sure your needs are met and progress is made. After all of the tests and evaluations are done, the results and recommendations will be shared with you.

Insurance

Many health insurance plans cover cochlear implants. But, plans differ and may need prior authorization. Medicare provides coverage for a single-side cochlear implant without the need for prior authorization if indications are met. Supplemental insurance may require prior authorization.

You may want to ask your insurance company some questions, such as:

- Do I have a deductible? What is my deductible?
- Do I have a co-pay, co-insurance or out-of-pocket maximum?
- Do I need prior approval for this surgery?
- Am I in-network or out-of-network with Sanford Health?
- Do I have a pre-existing clause, rider, or exclusion on my policy that affects what my insurance will pay?

Please bring all of your insurance cards to your visits. That way the medical facility will have the correct information.

Preparing for Surgery

You will receive a separate surgery booklet that will help you know what to expect. You will also receive a phone call before the day of surgery that will tell you where to go and the time to arrive.

After Surgery

Medical Care

Avoid heavy lifting or strenuous activity for 2 weeks after surgery. The surgeon will see you one week after surgery and look at the incision. Write down your questions and concerns so you can talk with your surgeon at this visit.

Follow-up appointments with your surgeon may vary depending on your progress and concerns or issues that arise. Often this means only seeing your surgeon yearly.

Audiology Care

The audiologist will activate the implant 2-4 weeks after surgery. After that, you will be seen often through the first year.

Visits will then be every 6 months or yearly. This will vary depending on your needs. Children will be seen every 3-6 months.

Speech Therapy

Children and adults who receive a cochlear implant should see a speech therapist before surgery. About 2-4 weeks after activation of the cochlear implant, you will need to return to see the speech therapist. You may continue to need speech therapy. Your visits may range from 1-2 times per week to once a month. How often depends on each patient's needs and wishes. You will have training in:

- Use of speech reading and sound input
- Receiving and understanding sound input
- How the environment can help you to gain full use of the cochlear device
- What will help at home

What to Expect During Recovery

Ear surgery is often not painful, but:

- Your neck or jaw may be sore.
- Your ear may be numb until the nerves for sensation re-grow.
- You may feel shooting pain from the nerves re-growing.
- You may hear popping or crackling noises due to healing and fluid in the ear from surgery.
- You may be dizzy after surgery (It should slowly get better. If it is getting worse, please call or come in to be seen.)
- You may have a funny taste in your mouth. (The nerve for taste is in the ear.) This may take days to weeks to improve.

Most people who have a cochlear implant do not understand speech when the implant is first activated. Sounds may be distorted and unnatural because you are hearing in a different way. It is common to dislike the sound quality at first. Wearing the processor during all waking hours will allow your brain to adjust to the sound quality. After a while, the sound will become clearer.

Equipment Problems

If your equipment is not working or you need help fixing a problem with your equipment, please call your audiologist or the company that made the implant. Companies who make cochlear implants employ people whose job is to try to help you, or your loved one, find out what is wrong. They can also mail equipment to you overnight. Often times, they are able to help you more quickly than your audiologist.

The three companies that make the equipment are:

- Cochlear Americas: (800) 523-5798
- Advanced Bionics Hearing Hotline: (866) 431-4977
- MED-EL: (888) 633-3524

The receiver placed under the skin during surgery has a 10-year warranty. All equipment worn outside the head has a 5-year warranty. At the end of that time, most insurances will cover repair or replacement cost. Extended warranty plans are also available.

Travel

When you travel, take extra parts with you in case of emergency, you may need:

- Back-up speech processor
- Battery pack
- Coil
- Cables
- Extra batteries. Disposable or rechargeable. If your batteries are rechargeable, do not forget a battery charger and adapter, if needed.
- Drying jar or Dry & Store box for overnight use as directed in the product guide. This is important if you will be somewhere with high humidity.

When You Travel By Air

You should leave your speech processor on so you can hear what is happening around you. If your processor is set on the telecoil “T” setting, you may hear some buzzing. This is normal.

Show your patient ID card and explain that you have a hearing implant. Tell them that the speech processor is a hearing device that you must wear in order to hear through the implant.

- Metal detectors and scanners will not hurt any part of the cochlear implant. If you pass through the security metal detector, your cochlear implant may set off the alarm.
- If the alarm goes off, security may use a handheld wand to screen you. The wand will not harm your cochlear implant, but it will beep when it passes over your implant.

Carrying Spare Parts Safely

When you fly, turn your spare speech processor OFF and keep it inside a carry-on bag. Place the bag onto the conveyor belt at airport security. The x-ray machine should not affect your MAP if the processor is turned off.

Never place your processor right onto a conveyor belt. Static electricity may build up and harm your MAP or program.

Turning Off Electronic Devices

Cochlear implant patients **do not** have to turn off their speech processors when instructions are given to turn off cell phones, music players or any electronics with an on/off switch. The FAA views a cochlear implant in the Hearing Aid category. Your implant cannot get in the way of the plane's systems. Your implant sends out radio frequency (RF) signals. They are very short range, less than 5 feet from the outside coil. During take-off and landing:

- If you have a remote assistant or Fine Tuner, turn it off because they send out high frequency radio waves.
- If your remote does not have an “off” switch, do not use this equipment.
- If you have a remote control for your speech processor, this should be turned off or not used.

Common Questions

Will my head be shaved for cochlear implant surgery?

Some hair behind the ear will need to be shaved, but not your whole head.

When should I be able to hear?

You will rely on your other ear until activation at 1 month. Your hearing with the implanted ear will get better as you retrain your brain to understand speech. It is important to always wear the device while you are awake.

What is the difference between hearing with a hearing aid or with a cochlear implant?

A hearing aid will make the sound louder while the implant will make the sound more clear.

How does hearing with a cochlear implant work if you have a hearing aid in the other ear?

You will get used to hearing 2 types of sound. Your brain will receive the information from both devices and you will learn to hear the information as one sound.

With a cochlear implant, will I hear a lot of background noise like I do with the hearing aid?

You will hear background noise with a cochlear implant. But, hearing speech more clearly will help you understand what is said even when there is background noise.

Can I wear my hearing aid during the month between surgery and activation?

No, it is important that the ear have time to heal after the surgery. During this time, you should not use your hearing aid in the implanted ear. However, you may continue wearing a hearing aid in your non-surgical ear.

Will I be able to talk on the phone?

Most people who have an cochlear implant are able to hear on the phone after a period of adjustment. Some use:

- Speaker phone
- Regular phone or cell phone
- Wireless accessories to stream the phone call to the implant and/or hearing aid. There are phone training programs to help you learn phone listening skills.

Can I have a MRI after the cochlear implant?

Your surgeon will be able to tell you if you can have an MRI with your device in place. Some models require removal of the magnet from the internal device before an MRI can be done. Even then the test may be distorted and not able to be read because of the implant. You will be able to have a CT scan with the cochlear implant in place.

Can I go swimming, or wear the speech processor in the shower?

The speech processor can get wet as long as the correct water accessory is used. You can order it when you meet with the audiologist to finish your cochlear implant order.

Other Resources

Family Voices is a national, nonprofit, family-led organization that promotes quality health care for all children and youth, particularly those with special health care needs. www.familyvoices.org

Hands & Voices is a national, non-profit, parent-led organization that offers unbiased support to families with children who are deaf or hard of hearing. www.handsandvoices.org

Schools for the Deaf offer many resources for children and adults.

- MN State Academy for the Deaf – www.msad.msa.state.mn.us
- ND School for the Deaf – www.nd.gov/ndsd
- SD School for the Deaf – www.sdsd.sdbor.edu

Hearing Journey is a blog that brings together people and their loved ones who have had a cochlear implant. You can chat and share stories or search by topics. There is also a live chat. This blog is monitored by a professional so you can trust the information posted. www.hearingjourney.com

The Communication Corner helps you build confidence in your ability to communicate over the phone.

<http://www.cochlear.com/wps/wcm/connect/us/communication-corner/program/adult-telephone.htm>

The device websites tell you about their products, as well as support and other resources:

- Cochlear Americas www.Cochlear.com/US
- Advanced Bionics www.AdvancedBionics.com/BeyondHearingAids
- MED-EL www.medel.com/us/user-support-us

Cochlear Implant Checklist

Appointment Dates

- _____ Cochlear Implant evaluation with audiologist*
- _____ Cochlear Implant evaluation with surgeon*
- _____ MRI IAC and/or CT of the temporal bone*
- _____ Videonystagmography (VNG) balance testing if needed and patient is 18 years or older
- _____ Speech/language evaluation before surgery
- _____ Follow-up evaluation with surgeon*
- _____ Finish Cochlear Implant order form with audiologist**
- _____ Pneumovax or Prevnar vaccine **
- _____ Pre-operative history and physical by primary care doctor**
- _____ Surgery
- _____ 1 week postoperative visit with surgeon
- _____ Cochlear Implant activation with audiologist 2-4 weeks after surgery
- _____ 3 months, then yearly visits with the surgeon
- _____ MAPping evaluations with audiologist at 2 weeks; 1, 3, 6, and 12 months
- _____ Speech/language evaluations starting 2-4 weeks after surgery
- _____ MAPping evaluations with audiologist every 6 months after first year

* These must be done to be sure the patient is a surgical candidate.

** These must be done before surgery.
