Phonak + AB resource

Introduction to CI (Cochlear Implant)

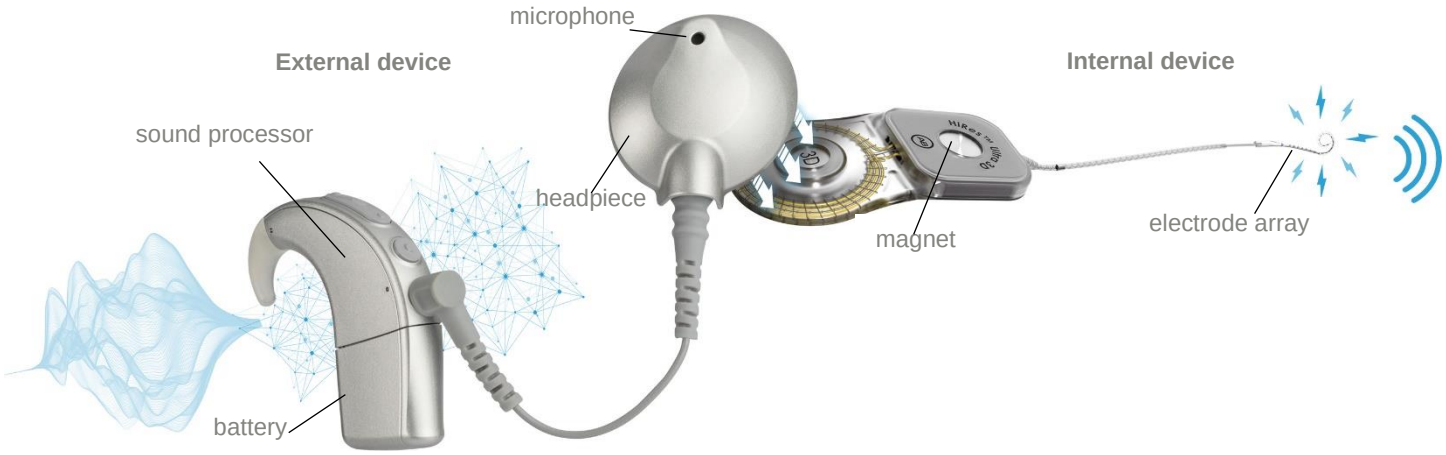
2019 - This resource was created by the first Phonak Teen Advisory Board.

What is a Cochlear Implant?

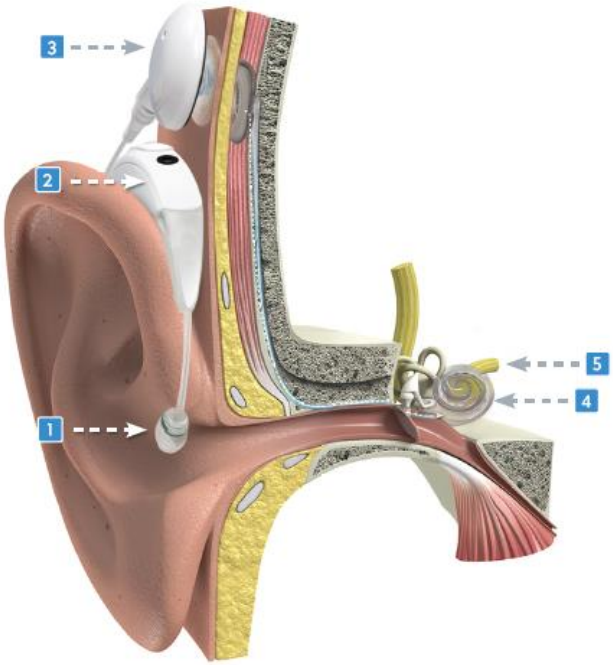
A cochlear implant (CI) is a type of surgically implanted hearing technology. CIs can improve clarity of sounds, music, and your ability to hear your friends and others talking. CIs can help you understand and connect to your world better and improve your ability to hear in noisy situations.

What are the components of a Cochlear Implant?

A cochlear implant system consists of an internal device and an external sound processor.



Follow the graphic below beginning with number 1 to learn how a cochlear implant works.



1. The microphone (T-Mic2) captures sound waves that pass through the air.
2. The sound waves are converted into detailed digital information by the sound processor.
3. The headpiece sends the digital singals to the internal device.
4. The signals are then sent to the electrode array in the inner ear and stimulate the hearing nerve.
5. The hearing nerve sends impulses to the brain, where they are interpreted as sound.

How does a cochlear implant help connect you to the world around you?

You can connect your cochlear implant to your phone, tablet, computer, gaming headset, or Bluetooth® devices. You can also stream music and movies to your cochlear implant.

How does a cochlear implant differ from a hearing aid?

There are many similarities and differences between a hearing aid (HA) and a cochlear implant (CI). From a benefits perspective, both will help you to hear the world around you whether that be hearing conversations, hearing music or helping to keep you safe. From a hardware perspective, both have a microphone that picks up the sound and then the hearing aid or cochlear implant prepares the sound before delivering it to the hearing nerve so that the information can be used by the person with hearing loss. Some of the preparation of the sound is ‘cleaning’ it. That means that some of the noise is removed and the microphones are adjusted so that the speech is heard more than the background noise. This works well in many, but not all, situations.

However, one major difference is the pathway from the sound arriving at the microphone to it reaching the final destination in the brain. A hearing aid makes the cleaned sounds louder and delivers them to the hearing nerve through sound waves. The hearing aid uses the entire hearing pathway when delivering the sound and therefore the sounds pass through both the healthy and damaged parts of the ear before reaching the hearing nerve. The loudness and clarity of the sounds depends on the number of functioning hair cells inside the cochlea and the integrity of the hearing nerve and pathway.

A cochlear implant works differently than a hearing aid. It doesn’t use the entire hearing pathway and doesn’t use sound waves for the whole journey. Instead, it captures the sounds in the environment, converts them to electrical signals that are sent directly to the auditory system via the implanted electrode array in the inner ear. In this way, a cochlear implant bypasses damaged areas of the auditory system and stimulate the hearing nerve directly.

For many children and teens, hearing aids provide the amplification they need to hear well in all the activities that they do. Sometimes, hearing aids are not able to provide enough benefit right from the start or when the hearing changes to the point that the hearing aids can no longer provide the needed assistance. Cochlear implantation is considered when hearing aids can’t provide enough sound for all the conversations you have and all the things you do.

Regardless of whether you get a new hearing aid or cochlear implant, it will take time to get used to the new sound and you will have to practice listening to the sound to be able to understand what you are hearing. It’s no different from training for your favorite sport, or practicing your musical instrument. Repeated practice helps the brain to learn to hear better just like repeated practice helps the brain learn to play at sports better.

Who is a candidate for a cochlear implant?

Cochlear implants are usually recommended for individuals with severe or profound hearing loss. If you wear hearing aids, but are still having trouble hearing clearly in classes, or have difficulty hearing your friends or family when you socialize or can't hear in loud places, you should talk to your audiologist to find out if you are a candidate for new hearing aids or a cochlear implant.

If you might be a candidate for a CI:
https://advancedbionics.com/us/en/home/cochlear-implants-for-you/are-cochlear-implants-right-for-me.html

What is a CI:
https://advancedbionics.com/us/en/home/contact-us/blog/what-is-a-cochlear-implant-biedenstein.html