

Cochlear Implants Equipment Troubleshooting (from the National Deaf Education Center)

The first step to optimal listening with an implant is a consistently functioning device. It is imperative that a cochlear implant be in working order daily and have an appropriate “map” for a child to obtain maximum benefit from their implant. Ongoing opportunities should be scheduled with the hospital implant center to monitor the chosen map to assure that it continues to meet the child’s needs.

Why Monitor the Map?

As the brain adjusts to sound, what may have at first been comfortable and “loud enough” becomes insufficient and “not enough.” This adjustment to sound may be clearly apparent or can sometimes go unnoticed, similar to a light on a dimmer that grows dim so slowly as to almost be imperceptible until it becomes too dark. A child may also inadvertently have electrodes that have been set for too much stimulation, causing discomfort. If this occurs and is not remedied, the child could possibly begin to see listening as a negative experience and may resist using the cochlear implant. If a child is functioning with an inappropriate map, this will negatively impact progress with the implant.

There are two types of checks that can be completed daily both at home and in school on a cochlear implant—an equipment check and a check of the child’s functional listening.

Equipment Check

It is not possible for parents and teachers to listen to a child’s cochlear implant as one would listen to a hearing aid; however, there are other checks of the equipment that should be completed daily.

Including the following in a daily check:

- Use a Signal check device (available from the implant manufacturers) to check the integrity of the transmitted signal when connected. A light indicates that all systems are working when the implant is on the child.
- Check all batteries daily (a weak battery will make a difference).
- Check coils and cables for wear and tear.

Functional Listening Check

In addition to checking the equipment, it is important to check a child’s performance with the equipment on a daily basis. One such check, familiar to many, is the **Ling Six Sound Test**. This check involves presenting a series of specific speech sound at a consistent loudness and distance from a child to document his or her sound awareness. When a child demonstrates a change in sound awareness from an established baseline response, this may reflect:

- A possible change in a child's listening potential that may require attention to his or her map, or
- An equipment malfunction.

This quick and easy check involves the following steps:

- Have the student sit at a distance of about three feet wearing his or her implant.
- Cover your mouth with a listening hoop (a specially designed barrier to present sound without distortion). This hoop can be made using an embroidery hoop with two layers of acoustic speaker cloth.
- Individually present each of the following six sounds: "mm," "oo," "ah," "ee," "sh," and "s". (These sounds represent the variety of the frequencies present in speech.)
- Have the child respond to sound (raise a hand, place a block into a container, etc.) when it is audible.

Note: This task can be completed only after a child is old enough to produce a conditioned response to sound.

This task does not indicate that a child can identify or understand the sounds presented.

Notes about the Ling Six Sound Test:

- Present each sound at a quiet level. If you present a sound too loud, it is difficult to determine when a mapping shift may have occurred. You want to confirm that the child is consistently aware of "very quiet" sounds.
- Be sure to vary the pause time between sounds. Children readily pick up on a pattern and false positive responses will occur. That is, signal, "listen," hold up the listening hoop, and then say nothing. The child needs to feel confident saying he or she doesn't hear anything.
- If you notice a change in response that does not appear to be related to behavior, contact the child's family or hospital implant center audiologist to discuss the issue.