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## COCHLEAR IMPLANT HEALTH: WHAT PATIENTS AND PARENTS SHOULD KNOW

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A cochlear implant is a device that can be used to improve hearing in people with a specific form of hearing loss known as sensorineural hearing loss (when sound cannot be properly transmitted from the inner ear to the hearing portion of the brain). Cochlear implants are typically used for people who do not benefit from a hearing aid or other assistive listening devices because of the severity of their hearing loss.

Unlike hearing aids, which increase the volume of sound and deliver it to the ear, cochlear implants bypass the area of the inner ear that is not functioning correctly (called the cochlea), and directly stimulate the nervous structures of the inner ear. Additionally, unlike conventional hearing aids, cochlear implants require a surgical procedure. The cochlear implant device has two components: an internal device that is implanted surgically, and an external device that is worn like a hearing aid. This external device picks up sound from the environment and delivers it to the internal device.

### **WHAT IS THE APPROPRIATE AGE RANGE FOR COCHLEAR IMPLANTS?**

Cochlear implants can be used on infants, children, and adults with severe to profound sensorineural hearing loss. The minimal age of FDA approval for cochlear implants is 12 months, however, devices have been safely implanted in infants as young as six months. Patients with better hearing at lower tones have been found to benefit from implants as well. There is no maximum age limit; recently, even people in their 90s have successfully received cochlear implants.

#### ***How Do I Know If I'm Eligible for a Cochlear Implant?***

To see if you or a family member are eligible for a cochlear implant, you should have a hearing test to evaluate your current hearing level. Next, a cochlear implant surgeon will look at your ear's anatomy and review your hearing test to see if you may be a candidate

for implantation. This may include a CT scan or MRI scan of your inner ear to ensure that the device can be safely implanted. You will also meet with an implant audiologist to have a cochlear implant hearing evaluation, which may include a more in-depth evaluation of your ability to hear noise and understand speech. In infants and young children, this testing is typically not performed. Cochlear implants are continually improving and can help many types of hearing loss.

### **WHAT DOES THE SURGICAL PROCEDURE INCLUDE?**

Cochlear implantation involves placing an electrode within the cochlea to bypass the area of the inner ear that is not functioning correctly, and directly stimulating the nerve. An incision is made behind the ear and a processor attached to the electrode is implanted behind the ear. The procedure is usually a same-day surgery, and you will need to see your surgeon within a few days to two weeks following surgery to make sure you are healing properly.

The device will be tested during surgery to ensure that it is working correctly, and that your ear is responding to the device. However, you will not be able to hear immediately following the procedure to let your wound heal before "activating" the device. This will be done by the implant audiologist approximately two to four weeks following the surgery depending on your age and healing. Once the device is activated, your implant audiologist will work with you to optimize the device's programming and your hearing response.

#### ***Why Are Vaccinations Important for Cochlear Implant Users?***

Bacterial meningitis is a serious, life-threatening infection of the brain and the fluid that surrounds the brain. Individuals who have a cochlear implant are at increased risk for bacterial meningitis. Although this risk is small, it is important for children and adults with

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cochlear implants to be vaccinated against the type of bacteria that seems to cause the majority of meningitis cases, *Streptococcus pneumoniae* (Pneumococcus). Additional vaccines are available against other potential causes of meningitis, including *Haemophilus influenzae* type b (Hib) and *Meningococcus*. These vaccines are widely available and strengthen the body's defenses against infection.

### **WHAT FOLLOW-UP CARE IS NECESSARY?**

Children and adults with cochlear implants who develop a middle ear infection (known as otitis media) or a fever of uncertain cause should seek medical treatment and monitoring until the infection resolves. Infections in a child or an adult with a cochlear implant should be taken seriously. Untreated middle ear and other infections may spread to produce meningitis. Cochlear implant users and their families should also be aware that vaccinations do not eliminate the risk of meningitis.

In addition, if an ear with a cochlear implant develops a discharge from the ear canal, causes pain, swelling, or redness around the processor behind the ear, or produces unusual ear symptoms or a watery nasal discharge, it is important to have that ear examined by the surgeon who performed the surgery, or another suitable experienced cochlear implant surgeon.

An annual checkup with an audiologist is recommended to map and reprogram the device as needed to ensure optimal hearing.

### **WHAT QUESTIONS SHOULD I ASK MY DOCTOR?**

1. How do I decide on which ear may need an implant, or both?
2. What do I do if I experience ear drainage?
3. What do I do if I experience abnormal sound or changes in sound quality?
4. What do I do if there is redness around the magnet site?
5. What alternatives are there for managing my hearing loss?