

FREQUENTLY ASKED QUESTIONS (FAQs)

The following FAQ's are intended to provide information on meningitis in pediatric cochlear implant recipients.

What is meningitis?

Meningitis is an inflammation of the lining of the brain and spinal cord and can be a very serious illness. Although most people recover from the disease, some are left deaf or blind, and in others it may prove fatal.

How many types of meningitis are there?

Essentially, there are two distinct types of meningitis: viral (caused by a virus) and bacterial (caused by a bacteria). Bacterial meningitis, while comparatively rare, is by far the most dangerous and is sometimes fatal.

Just how common is each type?

In the U.S. about 17,500 cases of bacterial meningitis occur each year.

Common viral meningitis is milder and occurs more often than bacterial meningitis. It usually develops in the winter and affects people under 30. Seventy percent of the infections occur in children under the age of 5.

What causes meningitis?

The bacteria that cause bacterial meningitis live in the back of the nose and throat region and are carried at any given time by between 10% and 25% of the population. It causes meningitis when it gets into the bloodstream and travels to the meninges (the protective tissue that covers the brain). What triggers this movement in a small number of people remains the subject of research. With viral meningitis, the viruses responsible can be picked up through poor hygiene or polluted water.

Can anyone get meningitis?

Yes, although research shows that certain age groups are more susceptible than others. These are the under 5's, the 16-25's and the over-55's.

A study lead by the CDC and published in the New England Journal of Medicine on July 31 2003 found that the incidence of meningitis is higher in children who have cochlear implants than in the population at large. Several factors were identified as increasing the risk of children in this group contracting meningitis: having a device with a positioner, the presence of cochlear malformations with a cerebrospinal fluid leak during surgery and signs of middle ear infection present at the time of implant surgery.

The new study, published in Pediatrics, found that the incidence of meningitis among all children with cochlear implants (all types of implants) decreased sharply in the months after implantation.

However, the study also found that the incidence of meningitis remained elevated for up to 4 years after implantation for children who have an implant with a positioner.

What are the main symptoms?

Again, with both forms there is a wide range which can onset in different 'combinations'. In adults and older children vomiting, high temperature, severe headaches, neck stiffness, a dislike of bright lights, drowsiness, other joint pains and seizures may be present. In babies and infants watch for fever with hands and feet feeling cold, vomiting, refusing feeds, high pitched crying, a dislike of handling, neck retraction, a staring expression, difficulty in waking and a pale or blotchy complexion. A rash may look like small clusters of tiny pinpricks at the beginning; these quickly develop into areas of skin damage. People become very sick, very quickly.

Is it true there are different types of bacterial meningitis?

Yes, they are called strains, and there are several worth mentioning; meningococcal, pneumococcal, Hib, TB and neonatal meningitis. TB and neonatal are very rare, and Hib (which almost exclusively affects under 4 years) has become rarer since the introduction of a vaccine for all children under 4.

What are the complications of meningitis?

With both forms there will be a wide variation in exactly how the disease affects a sufferer in the long term. Tiredness, recurring headaches, short-term memory difficulties and concentration problems are often reported, as are temper tantrums, forgetting recently-learned skills and babyish behavior in children, mood swings, aggression, balance problems and clumsiness.

Deafness (permanent or temporary) is a more serious outcome, while epilepsy/seizures, sight problems and brain damage have been known, but are relatively rare.

Are there vaccinations against meningitis?

Yes, there are vaccines against Hib and against some strains of *N. meningitis* and many types of *Streptococcus pneumoniae*. The vaccines against Hib are very safe and highly effective.

There is also a vaccine that protects against four strains of *N. meningitis*, but it is not routinely used in the United States and is not effective in children under 18 months of age. The vaccine against *N. meningitis* is sometimes used to control outbreaks of some types of meningococcal meningitis in the United States. Meningitis cases should be reported to state or local health departments to assure follow-up of close contacts and recognize outbreaks. Although large epidemics of meningococcal meningitis do not occur in the United States, some countries experience large, periodic epidemics. Based on the possibility of increased risk for this disease among segments of the college population, the American College Health Association (ACHA) in 1997 recommended that students consider vaccination to reduce their risk for potentially fatal meningococcal disease, and that college health care providers take a proactive role in providing information and access to the meningococcal disease vaccine.

A vaccine to prevent meningitis due to *S. pneumoniae* (also called pneumococcal meningitis) can also prevent other forms of infection due to *S. pneumoniae*. The pneumococcal vaccine is not effective in children under 2 years of age but is recommended for all persons over 65 years of age and younger persons with certain chronic medical problems.

Are the Centers for Disease Control's (CDC) immunization recommendations different for adults and children?

Yes. Please refer to the CDC website (see the link provided below) and talk with your physician about the vaccinations that are most appropriate for you or your implanted child.

What do I do if I can't afford the meningitis vaccinations?

Many medical insurance providers cover the cost of meningitis vaccinations. However, if you are having difficulty with insurance coverage for these vaccines, please contact Cheryl Anderson in Cochlear's Reimbursement Department for assistance (1-800-523-5798).

What does this mean for my child, who has a Nucleus Cochlear Implant?

As the CDC reported in its original study, young children with cochlear implants are more likely to contract bacterial meningitis, compared to their non-implanted peers. However, because the Nucleus 22, 24, and Freedom cochlear implants **do not** include an electrode positioner, your child will not incur the additional risk that has been associated with devices that have positioners. To further reduce the likelihood of meningitis, your child should be fully vaccinated against the disease; you should recognize the symptoms of meningitis (see below) and, if needed, be ready to seek immediate medical treatment for your child.

More recent Nucleus cochlear implant models have a stylet. Isn't that the same as positioner?

No. The stylet is a thin platinum tool that holds the Contour Advance electrode straight, while the surgeon inserts the electrode into the cochlea. Once the electrode has been inserted, the surgeon then removes and discards the stylet. The stylet is not implanted and does not serve the same purpose as an electrode positioner. An electrode positioner remains inside of the cochlea and 'pushes' the electrode close to the recipient's auditory nerve. The Nucleus Contour Advance electrode is also placed close to the recipient's auditory nerve, but without the use of a positioner.

If my child has a cochlear implant with an electrode positioner, should the positioner be removed?

The CDC did not recommend surgical removal of the electrode positioner or removal of the device itself, as a way of reducing the likelihood of meningitis. Parents should consult their child's cochlear implant surgeon for advice.

How do I know if I have, or if my child has, a Nucleus cochlear implant?

The manufacturer of your cochlear implant is clearly listed on your Patient Identification Card. In addition, the manufacturer's name, address, and telephone number can be found in the User Manual (instructions), provided with your speech processor. If you are unable to identify your implant's manufacturer, contact your health care provider.

Cochlear Limited, of New South Wales, Australia, manufactures all Nucleus implants.

What's the bottom line?

1. The CDC's first study showed that young children who have implants with electrode positioners are more likely to contract meningitis, compared to children implanted with Nucleus cochlear implants. The CDC's latest study found that this increased risk with a positioner continues to remain higher for as long as 4 years after cochlear implant surgery.
2. Nucleus cochlear implants **do not** have electrode positioners.
3. All cochlear implant recipients and potential recipients (both adults and children) should be vaccinated (see the CDC website and your physician for recommendations). Parents of implanted children should be able to recognize symptoms of meningitis and seek immediate medical treatment, should symptoms arise.

How can I find out more about meningitis?

Much of this information was taken from the Meningitis Foundation of America, a good resource for further reading. <http://www.musa.org>.

Additional information may be found on the following websites:

- Centers for Disease Control - <http://www.cdc.gov/ncidod/dbmd/diseaseinfo>
- American Academy of Pediatrics - <http://www.aap.org>
- U.S. Food and Drug Administration – <http://www.fda.gov/cdrh/safety.html>