Cochlear Implants

In the UK, over 800 children are born each year with a permanent hearing loss. The degree of hearing loss may vary, but recent research has confirmed that early diagnosis is very important so that the most appropriate help and support can be provided to meet each individual child's needs.

As soon as a diagnosis is made, it is important that the child receives support and encouragement to help develop communication skills.

Hearing aids, appropriate for the individual child, should be fitted without delay. It is essential that children receive continual support from their parents and professionals to enable them to make full use of their hearing aids. If hearing aids have proven to be of little benefit, then consideration may be given to other options such as vibrotactile aids and cochlear implants.

The role of the cochlea

The inner ear or cochlea enables us to hear. As sound passes through the outer and middle ear, tiny hair cells in the cochlea convert sound waves into electrical signals. These electrical signals travel along the nerve of hearing (the auditory nerve) to the brain. Most sensori-neural deafness is caused by loss of, or damage to, these hair cells. Where enough functioning hair cells remain, hearing aids may help by amplifying sounds to a level at which they can be heard.

In cases of severe to profound deafness, there may not be sufficient functioning

hair cells for hearing aids to be effective. For these children a cochlear implant may help.

What is a cochlear implant?

A cochlear implant stimulates the auditory nerve directly, bypassing the damaged hair cells to provide a sensation of hearing. The implant system has two parts. The external part consists of the speech processor (which either sits behind the ear or is body-worn), a lead, a transmitter coil, and a microphone. The internal part is surgically implanted under the skin behind the ear. It includes the receiver and a number of electrodes that directly stimulate the auditory nerve.

A few weeks after the operation, the microphone and speech processor are provided. These are tuned over a period of time to meet each child's needs. Following implantation the child and family will need long term support from the implant team, who will work closely with local professionals. This support is crucial to encourage the child to learn to listen to and understand the new signals from their implant.

Considering a cochlear implant?

The assessment process

Profoundly deaf children who show virtually no response to very loud sounds when wearing hearing aids may be referred for cochlear implant assessment. For children with some hearing, the decision to refer is more difficult. A child's actual hearing levels, particularly for high frequency sounds when wearing the most powerful hearing aids, will be taken into account when making this decision.

As a general guide, any child who cannot hear the full range of speech sounds at normal conversational levels through appropriate hearing aids, may be considered for cochlear implantation.

However, whilst extremely important, a child's hearing levels are not the only consideration. Medical assessment is essential to determine the suitability and feasibility of cochlear implantation, including special X-rays or scans of the ear. It will also be necessary to assess the child's communication abilities and general development. These assessments will be carried out by a number of professionals,including speech and language therapists and teachers of the deaf.
Most children are now being fitted with a behind-the-ear (BTE) processor, though body-worn processors are still used when more appropriate.

What can parents do?

- If you are concerned that your child may have a hearing loss, discuss this with your health visitor, GP or the NDCS.
- If your child has been using a hearing aid for sufficient time with little benefit, you should contact your ENT consultant or the audiology service that fitted the hearing aid to discuss your concerns.
- If you feel that your child should be assessed for cochlear implantation, you should contact your ENT consultant or audiological physician.
- If appropriate, your ENT consultant will be able to refer you to a children's cochlear implantation centre for specialist assessment.

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Deaf Connexions produces a range of information sheets covering all aspects of hearing loss and deafness. If you would like further information contact :

Deaf Connexions
Unit 14 Capitol House, 2-4 Heigham Street, Norwich, NR2 4TE
Telephone/fax : 01603 660889
Minicom : 01603 661113

E mail : **deafconnexions@btconnect.com**
Website **: www.deafconnexions.org.uk**