



Independent Hearing Care Services

Hearability information sheet COCHLEAR IMPLANTS

What is a cochlear implant?

A cochlear implant is an invasive surgical procedure where a sophisticated device (part of which) is implanted under the skin on the head. It is not a hearing aid as such as it does not amplify sounds, but sends stimulation direct to the nerve of hearing in the cochlea. The implant consists of three major components: a speech processor, a transmitter and an implant.

The development of artificial nerve stimulation began in the 1950's, and the first implant was completed in 1978. By 1998 some 10,000 children had received implants and continuing development brought a 24 channel implant. By 2001 over 36,000 adults had been implanted worldwide.

Who might benefit?

In people with normal hearing, sound waves travel through the eardrum and cause the tiny bones of the middle ear to vibrate. This vibration is transmitted to the fluid filled cochlea where nerve 'hair' cells respond to the vibration and send a response to the brain. The response is sent as an electrical signal along the nerve of hearing.

Cochlear implants are particularly suited to people with a severe or profound sensorineural hearing loss. In this types of deafness, the tiny hair cells in the cochlea that convert sound vibrations from the ear are damaged and so the hearing nerve cannot be stimulated.

The Cochlear implant acts as a bypass for these damaged cells and directly stimulates the hearing nerve fibres.

A cochlear implant is suited to post-lingual adults who have lost their hearing through meningitis, other illness or trauma or who have suffered progressive hearing loss but make good use of hearing aids. Once implanted, many people are able to gain awareness of environmental sounds, understand speech without speech-reading and use a telephone. The impression of sound described by many users is different to 'normal' hearing and is described by some as mechanical.

How do you get a cochlear implant?

All adult patients who want to go forward for a cochlear implant must be able to satisfy strict criteria as follows:

- severe to profound sensorineural hearing loss in both ears
- receive little or no useful benefit from hearing aids
- strongly motivated with realistic expectations

Prior to surgery, patients have to undergo a series of tests and assessments. A team of experts including audiologists, hearing therapists, surgeons and radiologists may be involved. The tests may include Magnetic Resonance Imaging (MRI) scanning of the skull to ensure that the surgery can safely proceed. Hearing assessments, measurement of speech and language ability and measures of speech-reading and listening skills are also completed.

Implant surgery can take from two to four hours, involving a short stay in hospital. About six weeks after surgery, the transmitter is fitted to the head. This is held in place by a small magnet. The speech processor is then connected to the transmitter. The processor comes in two types. One is a small body worn unit that is clipped to a belt, or there is now a processor that fits behind the ear. The processor is activated and programmed to suit the individual's needs. This process is known as 'switch on' and is followed by an intensive period of training and testing to ensure that maximum benefit is obtained from the device.

Once the processor is working, the task of rehabilitation begins. It can take a long time to learn to hear again, but this whole process is supported by hearing therapists and other members of the implant team. The speech processor is regularly reprogrammed during this phase. For most people, time and practice are required to make the most of their implant.

Further information:

There are three companies supplying implants in the UK:

Advanced Bionics www.cochlearimplants.com

Cochlear Ltd www.cochlear.com

Med El www.medel.com

For information from users of implants contact:

British Cochlear Implant Group BCIG www.bcig.org.uk

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