

Cochlear Implants: 2011

“ after newborn hearing screening, earlier implantation becomes possible”



Did you know?

- There are about **11,000** implant users in the UK.
- In 2010, about **500** adults and **500** children were implanted in the UK (NCIUA).
- The majority of profoundly deaf children in the UK have an implant.
- About 350 children per year are born deaf enough to be considered for an implant.
- About 100 more children per year become deaf early in life and may need an implant - giving an annual recurrent demand of 450 per year.
- In addition to those already implanted, about 7,500 adults are audiolgically suitable for an implant.
- The annual recurrent demand is conservatively estimated to be 1200, being 450 children and 750 adults.



What is a Cochlear Implant?

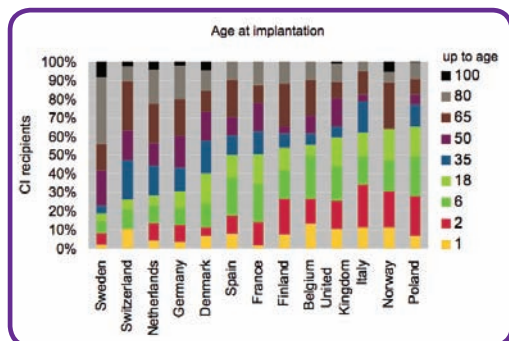
Cochlear implants provide useful hearing to adults and children who get little or no benefit from a hearing aid. They consist of:

- **The internal part:** the receiver, surgically implanted in the mastoid bone behind the ear, with electrodes inserted into the inner ear, (cochlea).
- **The external part:** the microphone and speech processor convert sound into an electrical signal which is sent to the electrodes in the inner ear. These then send the signal through the auditory nerve to the brain, where it is perceived as sound.

Age at Implantation

How the UK compare to the rest of the European countries:

The figure gives the percentage of their cochlear implant surgeries by age, and by country.



There is a trend to earlier implantation in the UK, although we still lag behind many European countries and UK has a smaller percentage of elderly implanted users than other countries.

(Data source Cochlear Europe Ltd)

We know that...

- ... cochlear implantation is safe, and reliable with low levels of complications, including in infants. ^{4,36}
- ... cochlear implantation is cost effective, both for adults, including those over 70, and for children. ^{3,40}
- ... the earlier children are implanted, the better the outcomes. ^{12,15,28,31,39,41}
- ... implantation soon after onset of deafness is more effective in older children and adults. ^{30,40}
- ... young people continue to wear their implants, to value them and choose re-implantation should the device break down. ^{2,5,25,50,52}
- ... there is evidence of benefit in those with severe hearing losses, not only profound losses.
- ... children with complex needs can benefit from implantation. ³⁸
- ... those who are born deaf or have been deafened early in life and implanted as adults can also benefit. ⁴³
- ... electroacoustic aids now provide combined benefits of implants and aid for those with low frequency hearing. ³³
- ... MRI scans are compatible with some cochlear implants

Evidence tells us...

that cochlear implantation enables most deaf children to: ^{12,19,28,29,32,39}

- acquire and understand spoken language, speak intelligibly and use the telephone.
- have improved literacy and educational attainments.
- attend mainstream schools.

that deafened adults can: ^{11,34,40,43}

- gain confidence in communication
- regain independence in everyday life.
- improve speech intelligibility.

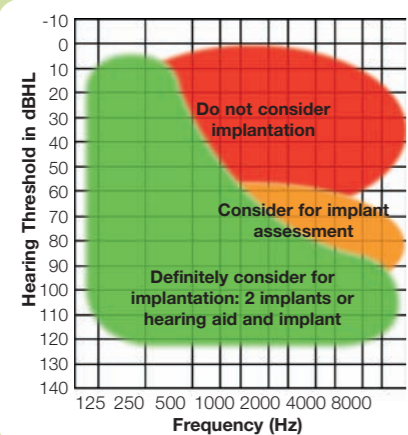


When hearing aids are not enough?

When hearing aids are not providing enough – there are a number of options, including cochlear implants and electro-acoustic hearing aids.

The starting point is careful and expert audiological testing and it is essential to explore what benefit the child or adult is receiving through their hearing aids. Tests of speech understanding are important to include when assessing older children and adults.

Some children have unusual or complex audiograms and they respond to speech with their aids but nevertheless they should be considered; the diagram shows the trend in audiological terms.



“With two implants, in noisy places, he can hear us call straight away”

Two ears: better than one?

Two ears enable us to listen more effectively in noise and to localise where sounds are coming from. This is important for understanding conversation in everyday life. We can provide two hearing aids, hearing aid plus implant, or two implants.... we know that:

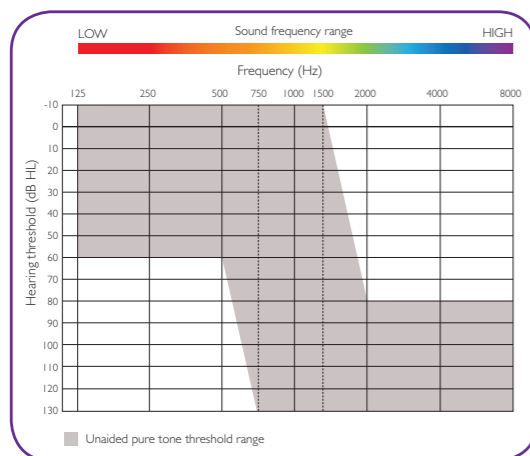
- increasing evidence shows improved listening in noise after bilateral implantation.^{6,7}
- children with unilateral hearing have difficulty in listening in class, with implications for educational attainments and for behaviour.⁸
- those with some residual hearing benefit from wearing a hearing aid and an implant.^{9,10}
- bilateral implantation is routine from an early age in many European countries and in the USA.^{7,23}
- increasing evidence shows improved localisation abilities after bilateral implantation.^{12,18,20,21,30}
- simultaneous bilateral implantation is most effective, early in life, or soon following hearing loss.^{14,22,23,25,31}
- sequential implantation has been shown it can be effective; particularly when there is a short time between the two surgeries and when the first implant was early in life.^{15,34}
- early bilateral implantation significantly improves communication and skill development compared with unilateral.^{18,31}

What about those with single-sided deafness?

We know that deafness in one ear can cause difficulties, particularly in listening in noisy situations, such as the classroom, a busy office or shop. There is increasing interest in thinking about cochlear implantation for those with single-sided deafness in order to provide benefit.

What about those with useful low frequency hearing?

In the past those with low frequency hearing were often not considered for implantation as the risk of losing this hearing was too great. Now, more and more are considering devices with use both electrical and acoustic stimulation thus providing high frequency information and preserving the low frequency hearing through a combination of hearing aid and cochlear implant technologies.



The cochlear implant pathway



Detailed information on care pathways can be found in Hearing Impairment Integrated Care Pathways with Evidence Base for Patients with Baha and Cochlear Implants, developed by the Hearing Impairment ICP Steering Group, in association with Cochlear Europe, June 2008. Further information on care pathways are contained in Cochlear Implant Commissioning Guidelines (RNID). Detailed diagrams of the pathway for both adults and children have been produced by the 'Do Once and Share' programme that is part of NHS Connection for Health. Carepathways available on www.mapofmedicine.com.

Cochlear implant centres in the UK

The names and contact details of cochlear implant centres in the UK can be found at www.bcig.org.uk. Each centre will have its own specialist team and information about its services.



Thinking about an implant? Don't delay referral

If as a parent, adult or professional you think a referral should be made for implantation, what should you do?

If you think that an implant should be considered, then contact your local ENT consultant or audiology service, to obtain a referral. If you are unsure about whether an implant is the right way forward, it is a good idea to ask for a referral to a Cochlear Implant Centre, because the implant process will involve the many tests and assessments which will help to clarify the situation. Assessments should involve the whole family as well as the child or adult – deafness in the family affects everyone, and cochlear implantation will make a difference to the family as well as to the individual. It is important during the process to meet others with implants and experienced professionals to discuss the options with you. Before the referral, there must be

an audiological evaluation and the best possible hearing aids fitted, with good ear moulds. Any ear problems should be carefully managed. Make sure you ask about the outcomes from the implant centre, about the devices used, about the important issues and what follow-up care will be offered – medical, scientific and rehabilitative. As well as discussing options with experienced professionals, it is important to ask to meet others with implants and parents of children with implants to ask about the services they received as well as individual outcomes. There are also independent groups who advocate for implant users and are happy to share experiences.



NICE recommends

The National Institute for Health and Clinical Excellence recommends cochlear implants for children and adults with severe to profound deafness.

The long technology appraisal by NICE of cochlear implantation reached its conclusion in January 2009, recommending:

- Unilateral cochlear implantation of those with severe to profound deafness.
- Simultaneous bilateral cochlear implantation for children.
- Simultaneous bilateral cochlear implantation for adults who are blind or have other disabilities that increase their reliance on auditory stimuli.
- A sequential bilateral implant for those who had a unilateral implant before the publication of the guidance and who are either still a child or an adult who is blind or has another disability which increases reliance on auditory stimuli.

While the benefits of bilateral implantation are recognised by NICE, the challenges of implementing the guidance remain. NICE will be reviewing their guidance in 2011.

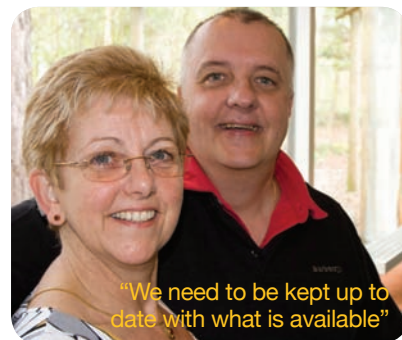
The current National Bilateral Audit being carried out by cochlear implant centres will be immensely useful to this.

“growing up with our implants, it's good to get together”



What if you already have an implant?

Technology is being updated regularly- processors, and more and more accessories are available to help you in noisy situations or to listen to music for example. You may wish to think about trying accessories such as an FM system which can help in groups and in noise. See the Sound Advice service at The Ear Foundation.



Quality Services

Benchmarking practice and outcomes – how and when?

The Commissioning Guidelines (RNID) recommend that cochlear implant centres are asked to provide a minimum data set in order that practice is monitored and progress by individuals or groups benchmarked over time. Some implant centres provide progress reports, showing for example:

- Numbers implanted, by age, complexity and devices used.
- Explants and reasons: re-implantations and reasons.
- Surgical complications, infection and failure rates.
- Numbers wearing implant systems, by year after implant.
- Indications of progress over time – measures of speech perception and production.

Such information should be available on request.

Useful Guidelines and Quality Standards are available from British Cochlear Implant Group and National Deaf Children's Society. Useful information about cochlear implants available from:

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

RNID www.rnid.org.uk

Cochlear Implanted Children's Support Group www.cicsgroup.org.uk

National Deaf Children's Society
www.ndcs.org.uk

National Cochlear Implant Users Association www.nciua.org.uk

British Association of Teachers of the Deaf www.batod.org.uk

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