



Cochlear implants

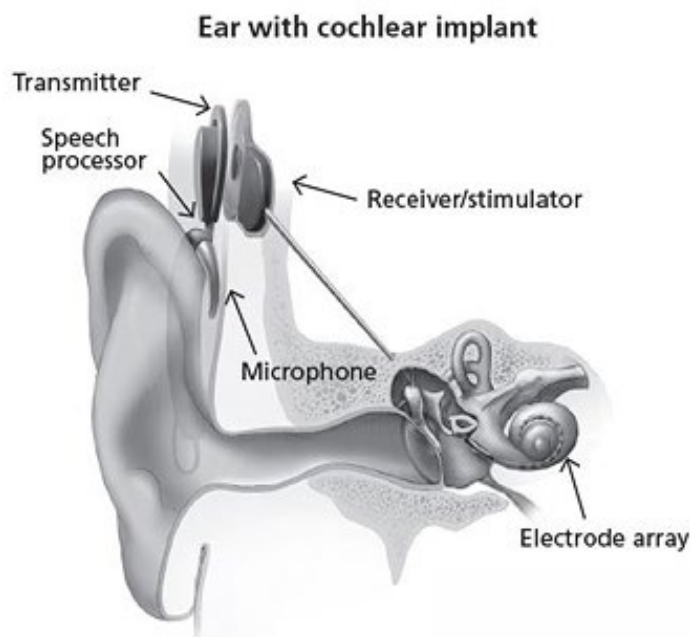
This leaflet explains what a cochlear implant is, who is suitable for one and the advantages and disadvantages for those considering cochlear implant surgery.

What is a cochlear implant?

A cochlear implant is a surgically implanted electronic device that provides a sense of sound to a person who has a severe or profound hearing loss. A cochlear implant does not cure deafness or hearing impairment, but provides the brain with a sensation of sound using direct stimulation of the inner ear (the cochlea).

A cochlear implant consists of an external portion, which sits behind the ear, and an internal portion that is surgically placed beneath the skin:

- **External:** the microphone, speech processor and transmitter.
- **Internal:** the receiver, which is surgically implanted into the mastoid bone behind the ear, with electrodes inserted into the cochlea.



How does a cochlear implant work?

A cochlear implant is very different from a hearing aid. Hearing aids amplify sounds so they may be detected by hearing impaired ears. A cochlear implant can bypass the impaired portion of an ear and directly stimulates the inner ear.

When a sound is detected by the external microphone of the cochlear implant, it is converted into an electrical signal which is sent to electrodes within the cochlea. These signals travel along the auditory nerve to the brain, which recognises the signals as sound.

Cochlear implants can give a perception of sound and will allow the user to access (hear) speech sounds. The brain can then learn to interpret these sounds as speech. It will take time for the user to make sense of the new sounds they are hearing.

Is a cochlear implant right for me?

A cochlear implant is suitable for people with a severe to profound hearing loss, who have limited benefit from standard hearing aids. There are factors that affect the outcomes of having cochlear implants, which means it is not always possible to predict how well they will work for each person.

Cochlear implants are often most successful for people who have experienced a relatively short period of deafness. Adults who have become deaf, or whose hearing has worsened to a point where hearing aids are no longer beneficial, will generally have better outcomes. Adults who have heard speech, either with or without hearing aids, before becoming deaf are likely to adapt quicker to the new sounds they experience with cochlear implants.

Some possible outcomes include:

- Easier communication with other people.
- Reduced reliance on lip reading.
- Talking on the telephone with familiar speakers.
- Improvement in the control of volume for one's own voice.
- Greater access to sounds, ranging from quiet to loud.

However, a cochlear implant user is still likely to have some difficulty in noisy environments or when listening to people in large groups.

Adults who have been deaf for many years and who have not consistently worn hearing aids tend to take longer to adjust following implantation and are less likely to hear as well with a cochlear implant as those who have experienced deafness for a shorter period of time. This is because the auditory pathways in the brain have weakened due to lack of stimulation over time and it is difficult for the brain to adapt to hearing and make use of sound in a meaningful way. Cochlear implants can still benefit this group of people, but they need to be aware that the outcomes will be variable.

Adults who were born deaf, or were deafened before they learnt to talk, may be able to use their cochlear implant to provide an awareness of sounds in their environment, but may not be able to understand speech without lip reading or sign support.

Which ear is implanted?

Funding for implantation in adults is normally limited to one cochlear implant per person. The cochlear implant professional and the patient decide together which ear is the best to implant. This can depend on:

- How long they have had deafness in each ear.
- Whether they wear hearing aids.
- If there are anatomical or physical reasons why one ear would be better than the other for implantation.

What happens during implantation?

The cochlear implant will be put in place during surgery, typically under general anaesthetic (patients are unconscious throughout). Implantation takes between 3-4 hours. It is usually possible to go home on the same day. Recovery time following the operation can vary.

The cochlear implant rehabilitation process

The initial switching on and fitting of the external sound processor is approximately two weeks after the operation. The implant is stimulated at a very quiet level and then increased to a level which is comfortable. At this stage, people often report that speech sounds robotic; like 'Micky Mouse' or like someone talking with helium. Others report feeling a vibration before they can

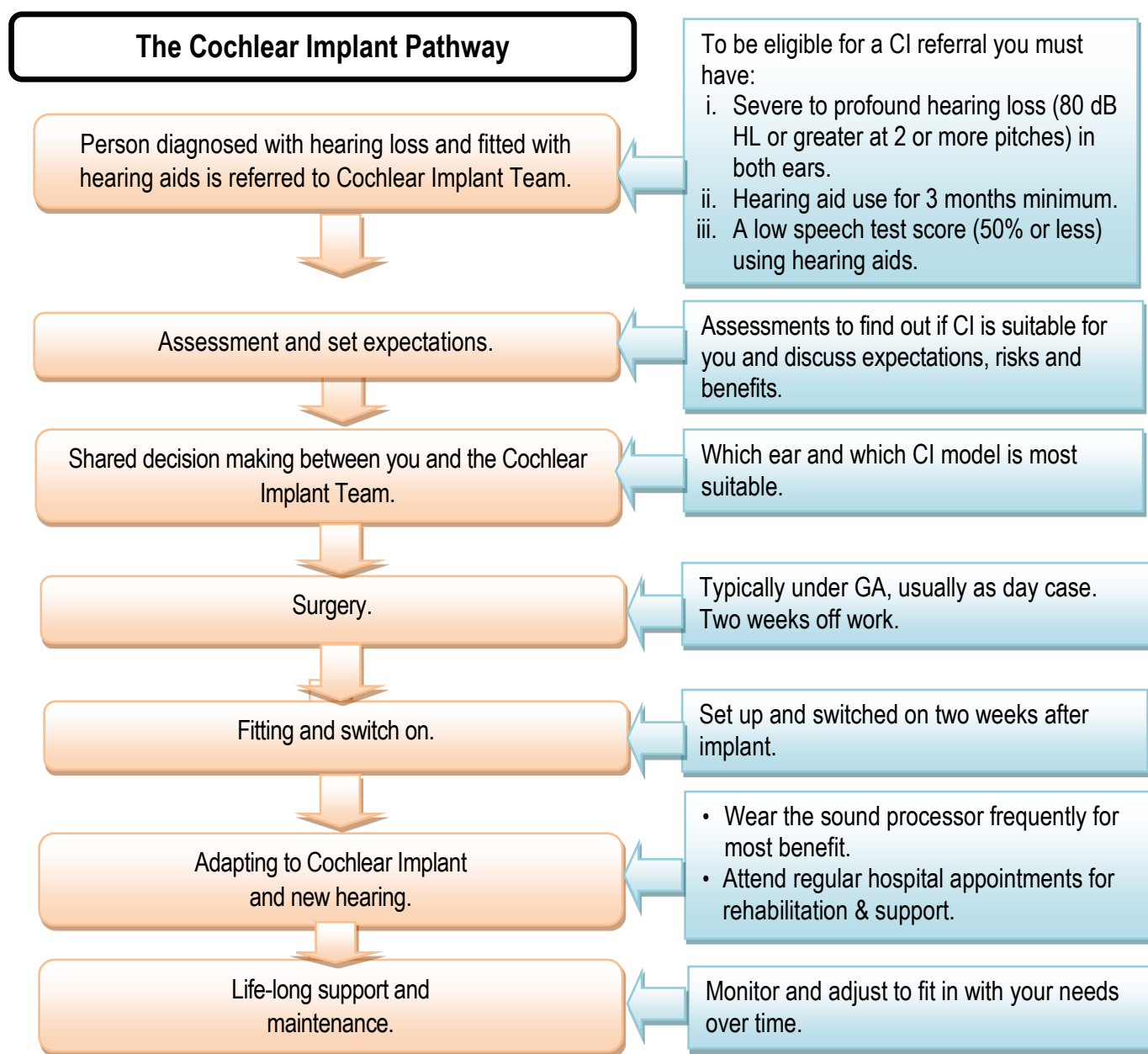
identify sound as speech.

Individuals who previously heard speech may not initially hear speech as they remember it. The brain adapts to new signals and gradually learns to make sense of speech sounds over a few months. For some people, speech is clear quite early on, but other people are never able to understand speech without cues, lip-reading or sign support.

In the first year after implantation, a user visits the hospital for multiple tuning and speech and language therapy appointments. Adults often have three appointments in the first month, then a further 6-10 appointments over the rest of the year. This varies depending on how quickly an individual progresses with the rehabilitation process.

The cochlear implant pathway

The diagram below shows what to expect from diagnosis/referral to life-long use for a typical adult. However this can vary according to individual cases and between cochlear implant centres:



Summary

Cochlear implantation is a well-established, low-risk procedure with positive outcomes. As a result, the National criteria¹ for cochlear implant eligibility has changed; increasing the number of people who can access this potentially life changing technology.

If you have a severe to profound hearing loss and find that you are gaining limited benefit from your hearing aids, we recommend that you consider cochlear implant assessment. Your audiologist will support you with your decision, answer any questions you may have, and ultimately refer you to your nearest cochlear implant team. An initial assessment of eligibility can be undertaken locally by the Royal Berkshire Hospital Audiology Department, before onward referral to a Cochlear Implant Centre.

For more information, *RNID* offer an informative booklet that can be accessed online and in hard copy (see contact details on following page). We can also put you in touch with manufacturers and/or current cochlear implant users if you felt this would be beneficial to you.

Further information

If you want to find out more about cochlear implants, the following websites are useful:

- The British Cochlear Implant Group (BCIG): <https://www.bciq.org.uk>
- RNID: Tel: 0808 808 0123 Text: 0780 000 0360 <https://rnid.org.uk/information-and-support/hearing-loss/hearing-implants/cochlear-implants/>
- The Oxford Auditory Implant Programme: <https://www.ouh.nhs.uk/audiology/services/auditory-implant-programme/>
- The University of Southampton Auditory Implant Service (USAIS): <https://ais.southampton.ac.uk/>

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Website: www.royalberkshire.nhs.uk/audiology

To find out more about our Trust visit www.royalberkshire.nhs.uk

Please ask if you need this information in another language or format.

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¹ National Institute for Health and Care Excellence (2019) *Cochlear Implants for children and adults with severe to profound deafness* (NICE Guideline TA566). Available at: <https://www.nice.org.uk/guidance/ta566/resources/cochlear-implants-for-children-and-adults-with-severe-to-profound-deafness-pdf-82607085698245> [Accessed 28 August 2019].