

## PAEDIATRIC COCHLEAR IMPLANTATION

Adult CI procedures differ from children's surgery in several ways. Generally, they have well-developed speech; CI for adult pre-lingual patients carries a very guarded prognosis. A long adaptation to deafness may have occurred, giving lip-reading or other additional skills. Few have cochlear damage or distorting disease. Motivation may be strong, especially in the aged or recently deafened. Many are familiar with the concept of hearing technology.

However, if deafness has been present for extended periods, outcomes will be affected in some cases. Strong support by associated family or friends for postoperative adaptation to the CI is desirable. Adults as a rule are not as supple as the young in adaptation to CI.

### Presentation:

Cochlear implantation is a great boon for most mature-deafened patients. Although the concept of adult CI has perhaps been less publicised than the paediatric, acceptance of this modality has steadily advanced such that the severely afflicted tend to be more readily referred for evaluation. This has been the case particularly for the aged deafened patient, where isolation has increased with the loss of friends, then from the family circle; CI has proven to be "God's gift" for this group.

Implantation is considered when the patient is struggling with hearing aids; the thrust of evaluation commonly centres on speech discrimination. CI is appropriate when the patient's communication ability cannot cope even with the most advanced aiding.

### Case evaluation:

However, evaluation, as with children, remains a thorough task. Aspects examined particularly include age effects (especially cognition and senility), motivation, postoperative support, and the duration of deafness. Psychological assessments are required to ensure that the patient's (and family/carer's) expectations and motivation are appropriate. In some cases social work support or input is relevant.

### Investigations:

Audiology assesses the hearing and speech discrimination. Radiology (CT and MRI scans) ensure that the inner ear and its connections to the brain are receptive for implantation. Psychological evaluation is important to ensure that the patient's expectations and motivation are appropriate, and to ensure in the very aged that intellectual ability remains unhindered.

### Surgery:

The surgical process has been refined to short and atraumatic surgery; complications are uncommon. The implant is placed under the skin above and behind the ear using a [small C-incision](#) on the rear of the ear itself. The electrodes are passed into the cochlea through a limited opening in the mastoid bone. The surgery for routine cases generally takes about 30-40 minutes.

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#### Other Locations

Beenleigh

Sunnybank

Mt Ommaney

Caboolture

In adults, bilateral surgery is best avoided. Adults differ from children with respect to the affect of surgery on balance. This is rarely troublesome for the child, but bilateral surgery on an adult risks severe and lasting imbalance. Fortunately, vestibular problems are generally benign in CI, as the balance apparatus is damaged along with the hearing, such that CI produces relatively little effect, usually rapidly compensated. Bilateral adult CI is therefore usually sequential rather than concurrent.

In practiced hands the surgery is normally uneventful. The aged group may be more prone to wound repair delays, but these are not usually troublesome.

## Rehabilitation:

Considerable adaptation for best outcomes is necessary and best undertaken using a thorough program of auditory exercises. Family or other carer support is invaluable through this phase. Nonetheless, the great majority of adult patients do well, with many being very difficult to notice as deaf, and many achieving good telephone ability.

## CI in Adult Unilateral Deafness:

CI may be used in adults who are profoundly deaf in one ear, but the results are less certain than when this modality is employed in children; a greater proportion of cases may be disappointed. The surgery is best applied in recently deafened individuals, although many longer term cases will benefit.

Alternatives include the use of CROS/BiCROS aids. These utilise a receiver on the deaf ear that transmits to an aid-like device in the opposite ear to provide hearing from the deafened side. The BiCROS device also amplifies sound, if the better ear is impaired.

Also, active bone conduction implants ([Bonebridge](#) or [BAHA](#) devices) may be used if the contralateral ear has excellent hearing. These simplify the external mechanisms to a small magnetic “button” above and behind the ear. Both these and the CROS aids methods deliver clearer speech reception than cochlear implants. They eliminate the dead zone on the deafened side (“head shadow”), but do not restore direction finding, stereo, or bilateral summation.

The CI, whilst delivering these latter benefits, provides speech reproduction that usually does not match the BC/CROS or bone conduction methods. The appropriate benefits and the disadvantages thus remain an individual assessment.

Not uncommonly, adults struggle with hearing aids for many years before coming aware of the benefits of CI and being referred for evaluation. Fortunately, this is becoming less common as the effectiveness of the surgery becomes more widely appreciated.

## More information:

[Case Study – Cochlear Implant](#)

[Cochlear Implants](#)

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