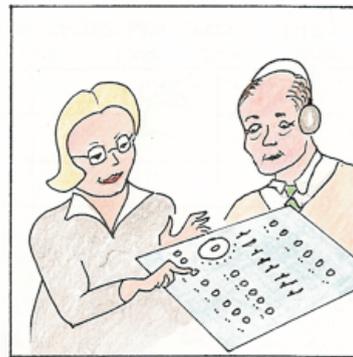


Hearing Aids and Cochlear Implants

Hearing Assessment

To determine an individual's level of hearing or investigate hearing loss, an assessment needs to take place. There are several different types of hearing tests that focus on different aspects of the hearing mechanism (see www.icommunicatetherapy.com for more information on hearing assessment).

There are a range of hearing tests which measure different parts of the hearing mechanism. It is likely most adults and older children will begin with a standard Audiometry assessment where the individual is played a series of sounds (high and low frequencies) to see what they can hear and to determine the hearing thresholds.



Tests are commonly performed on newborn babies or infants to assess for hearing loss. These tests will be objective, measuring physiological responses of the hearing mechanism. Older babies and young children may have subjective or behavioural assessments where the audiologist produces sounds and observes the baby's behaviour or response to sounds.

Following a consultation and a hearing test with an Audiologist, the fitting of some form of amplification may be suggested if the audiologist feels it would be beneficial. The Audiologist should reassure the individual by describing the benefits of hearing aids and advising on the range of aids available. It may be a good idea to focus on what the individual wants from an aid e.g. to hear conversations in meetings at work, or to converse with his spouse more easily etc. This can help encourage the individual if they can see the potential benefits. These actions may also help reduce the negative social perceptions some people have about wearing a hearing aid.

Following the fitting of the hearing aid the audiologist should provide some orientation sessions. These sessions will focus not just on hearing aid care and troubleshooting, but also adjusting amplification, discussing hearing aid use in different environments, and communication strategies.



Following a hearing assessment, if an impairment is present the individual may require hearing aids.

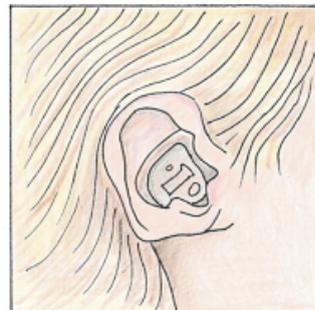
Hearing aids

Hearing aids, do not replace your hearing, but amplify the sound. Hearing aids are either analog or digital. Digital technology is generally used now in the development of hearing aids as this has many benefits over analog. It is easier to tailor digital hearing aids to an individual's unique hearing loss. Digital aids are also able to remove distortion that was present in analog aids and get rid of feedback. The modern aids are also tailored to pick up speech frequencies and facilitate the listener to hear speech when there is background noise.

Both children and adults can wear hearing aids. With very early detection of hearing impairment, young babies are now being fitted with aids to make sure that they do not miss out on the crucial aspects of development with respect to speech and language.

Hearing aids work well for individuals with a mild to moderate loss. Hearing aids will help those with a profound loss, but to a lesser extent. For those with hearing loss in both ears it is advantageous to wear an aid in each ear not only to improve your hearing ability, but also to avoid auditory deprivation of the unaided ear. Auditory deprivation may occur because the unaided ear is not receiving as much stimulus as the aided ear and begins to lose its ability to process information.

FM systems have been found to work well in the classroom, with the teacher wearing a transmitter and the hearing impaired child a receiver. The signal is transmitted by an FM radio transmission to the child's hearing aid. This has the advantage of cutting out a lot of background noise when the child is in the classroom. These systems have been found to work, not just with hearing impaired children, but children with auditory processing disorders and attention deficits. A similar type of system called a Loop system can be used to help adult hearing aid users in busy environments such as churches, conference halls and meeting rooms. Many buildings already have a loop system set up.



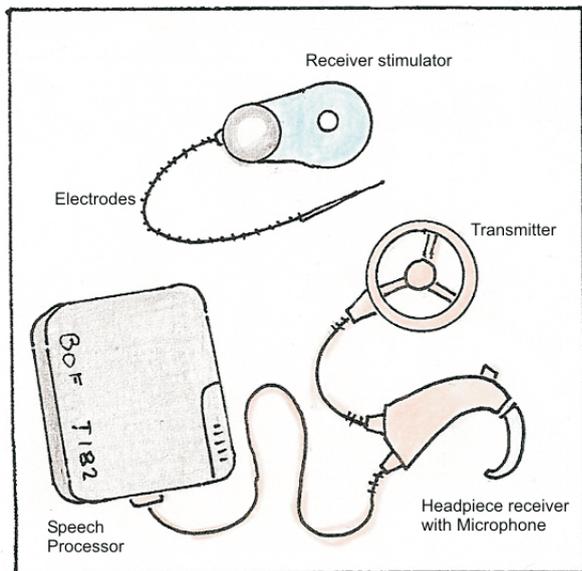
Hearing aids used to be large and unattractive, but many modern ones are now so small that they hardly noticeable.



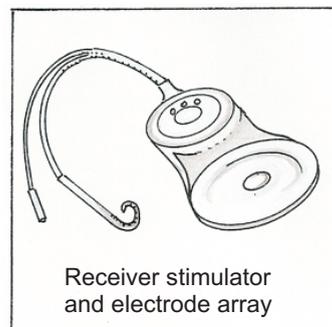
Cochlear implants

Individuals with profound hearing loss may not benefit from ordinary hearing aids, but can often improve their hearing with a cochlear implant. Although the implant does not replace normal hearing it gives the listener a good representation of environmental sounds and is especially good for distinguishing speech sounds and spoken language. Normal hearing aids amplify the sound, implants attempt to bypass the damaged parts of the hearing mechanism and take the sounds straight to the auditory nerve. Implants require a surgical procedure to implant an electrode into the cochlea. The whole device is made up of several parts:

- A microphone which picks up the sounds
- A speech processor that selects the relevant sounds from the microphone
- A transmitter that turns the sounds into electrical impulses
- A receiver under the skin sends the impulses to an electrode array which sits in the cochlea. This sends electrical impulses to the auditory nerve



Over 100,000 people a year receive implants worldwide. Adults who have had hearing, but lost it, are also benefiting from implants. Implant operations are now being carried out on children as young as 12 months to ensure they gain the maximum benefit during that early critical period for learning and recognising speech and language.

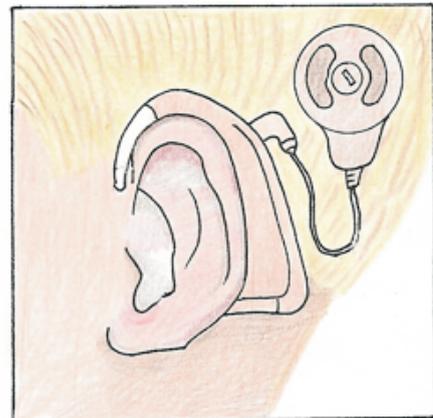




Candidates for an implant have to meet certain criteria prior to the operation because it is an expensive procedure. For children, there added criteria because the success of the implant is dependant on sufficient input from the child's care-givers and the medical/educational team around the child. After the operation care-givers have to be committed to encouraging the child to wear the implant and they must also be committed to carry out practice and therapy tasks given by the speech and language pathologist/therapist and audiology team. Many of these tasks can be carried out with the child during day to day activities (see www.icommunicatetherapy.com for ideas and activities to help develop speech and language skills with implanted children). Cochlear implants are still not a replacement for normal hearing, but they are more effective than normal hearing aids for a severe to profoundly deaf individual. If the child is implanted at an early age and there is good habilitation services and a strong commitment from the family, children with cochlear implants often develop very good speech and auditory discrimination skills. Some children with cochlear implants have speech that is as good, if not better than their "hearing" classmates.

Other criteria that a suitable candidate should meet:

- have a functioning auditory nerve
- not benefit enough from other kinds of hearing aids
- have potential for good speech, language, and communication skills
- live in, or desiring to live in the "hearing world"
- have appropriate services set up for post-cochlear implant aural rehabilitation (through a speech language pathologist/therapist, deaf educator, or auditory verbal therapist)



There are some cultural and ethical issues around cochlear implants. There are many people within the deaf community that believe it is unfair that a child cannot make the choice between being part of the deaf or the hearing community. The children who are implanted may grow up not knowing whether they are more part of the deaf community or the hearing community. However, if the hearing impaired child is left until he is old enough to make that decision for himself, he will miss the critical period where speech develops and the brain learns to interpret sound.



Hearing Aid checklist

There are many reasons why a hearing aid might not be working:

- Check the battery - are they inserted properly, are they flat?
- Is there feedback? Check ear mould fitting, volume and battery
- Check the aid, are there any cracks, loose fittings and does everything fit together properly?
- Check volume
- Is tubing blocked by wax?

It is handy to have a kit which includes small screwdrivers, spare batteries, battery testers, stetaclips and some spare tubing.

Checking a Cochlear Implant

An implant is a little more complicated than a normal hearing aid, but some things still apply such as checking the batteries, wiring and fittings. Also check for faults in the processor, transmitting coil and microphone. You should have a device from the manufacturer to check the microphone and coil. The processor needs to be switched on, the volume and sensitivity set, and programme location selected. Following implantation and set-up, future visits to the audiologist will address any problems with the implant and fine tune it.

Ling Sound Test

Once you have checked the hearing aid or cochlear implant and you believe it is set to optimum, try carry out the Ling sound test. This test shows if the child can detect the sounds within the spectrum of hearing, and up to what distance they can detect them. This is vital information when a child has to listen in a classroom. Try this on each aid separately.

This test involves 6 sounds: mm / oo / ah / ee/ sh / ss. Testing for these sounds helps to see if the child can detect those sounds that lie within the speech spectrum of hearing. To carry out this test start very close to the child and produce the 6 sounds. The child should not be in a position to lipread, but should acknowledge when they hear the sounds. Slowly move away a foot at a time repeating the sounds until the child starts to have difficulty hearing them. Repeat this test each day as the child's hearing might vary because of background noise, middle ear infections, or faulty hearing aids.

For more information about hearing impairment, hearing aids, cochlear implants and strategies to facilitate communication go to www.icommunicatetherapy.com



To learn more about hearing impairment, hearing aids and strategies to enhance communication, you can read about and purchase books on our website www.icommunicatetherapy.com. Click this link to see our online Resource Centre.

Suggested Reading

Suggested reading:

Cochlear Implants: Auditory Prostheses and Electric Hearing by Fan-Gang Zeng, Arthur N. Popper, and Richard R. Fay

Children with Cochlear Implants in the Educational Setting (School-Age Children Series) by Mary Ellen Nevins and Patricia M. Chute

Better Communication and Cochlear Implants: A User's Guide by Donna S. Wayner; Judy Abrahamson; June Casterton

Cochlear Implant Rehabilitation in Children and Adults by Dianne Allum

Cochlear Implants by Susan B., Ph.D. Waltzman and J. Roland

Cochlear Implants: A Practical Guide by Huw Cooper and Louise Craddock

School Professionals Working With Children With Cochlear Implants by Patricia M. Chute and Mary Ellen Nevins

Hearing AIDS by Harvey Dillon

Hearing Aid Handbook: 2008-2009 by Jeffrey J. DiGiovanni

The Hearing Aid Decision: Answers to Your Many Questions by Randall D. Smith, Jerome G. Alpiner, and Megan Mulvey

Digital Hearing Aids by Arthur Schaub

Assistive Technology for the Hearing-impaired, Deaf and Deafblind by C. Andersson, D. Campbell, A. Farquharson, and S. Furner

Overcoming Hearing Aid Fears: The Road to Better Hearing by John M. Burkey

Hearing Aids - Can Be Your Best Friend: Learning More About Your Hearing Aid & Improve your Hearing and Word Understanding by Lindsay Pratt

Assistive Devices for Persons With Hearing Impairment by Richard S. Tyler and Donald J. Schum