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Lend an ear to surgery

Mr Simon Lloyd specialises in conditions affecting the ear, especially chronic ear disease and impairment of hearing in adults and children. Mr Lloyd also deals with imbalance problems, tinnitus and the treatment of skull base disease. [here](#), he discusses some of the conditions that he treats regularly.

One of the most exciting aspects of being an ear surgeon is the ability to restore function to one of our key senses: hearing. Enormous strides have been made over the past 20 years in hearing-restoration surgery.

The human hearing system consists of the eardrum, the cochlea, and the hearing bones. Sound hits the eardrum and is transferred

through the hearing bones to the cochlea, where sound is converted to electrical energy in order that the brain is able to interpret it.

Surgery for hearing loss

There are now implants available that can correct hearing loss resulting from problems in any part of the hearing system. There are artificial hearing bones available which measure only two to three millimetres across and allow the transmission of sound to the inner ear when the original hearing bones have been damaged through chronic ear infection or injuries to the ear. There are also special laser procedures available.

For patients who have very severe hearing loss, cochlear implants offer the chance to restore hearing. These devices are implanted under the skin and pass into the cochlea to

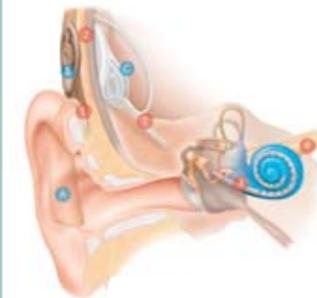
stimulate the hearing system electrically when the cochlea no longer works properly. People whose hearing has become so bad that hearing aids are no longer effective are likely to benefit from this type of implant.

Some people who wear hearing aids find them inconvenient or uncomfortable. Occasionally, the hearing aids can cause trouble with recurrent infections. For these patients, there are new implantable hearing aids available that avoid anything in the ear itself. New devices like the Soundbridge and Bonebridge implantable hearing aids are now available and are starting to revolutionize hearing restoration in patients with this type of problem.

The Bonebridge device is the latest in high-tech hearing aids for patients that have damage to their ear canal, eardrum or hearing bones.

How a cochlear implant works

For those with severe hearing loss, cochlear implants offer the chance to hear again



1. The sound processor (A) captures sound and converts it into digital code.
2. The sound processor transmits the digitally coded sound through the coil (B) to the implant (C) just under the skin.
3. The implant converts the digitally coded sound to electrical signals and sends them along the electrode array, which is positioned in the cochlea.
4. The implant's electrodes stimulate the cochlea's hearing nerve fibres, which relay the sound signals to the brain to produce hearing sensations.

Cochlear implants, which stimulate the hearing system electrically, have been one of the greatest success stories in modern-day medicine, allowing children who would otherwise never hear or speak properly to function normally, and also giving adults (who are deafened later in life) better hearing.

It has two parts, an implantable part that is placed surgically under the skin behind the ear and a small removable microphone/sound processor that attaches to the skin over the implant by magnetism. Sound is picked up by the microphone and a signal is sent to the implanted component that makes a tiny crystal within the implanted part of the device vibrate. This vibration is picked up as sound by the cochlea. A 30 minute operation is required to insert the Bonebridge but it can be used almost immediately afterwards.

from the cochlea to the brain. The hearing system in these children can be stimulated by an implant placed next to the hearing pathways in the brainstem. This type of implant is called an auditory brainstem implant, and is at the cutting edge of hearing implantation.

Sometimes, however, curing hearing loss is much simpler. For example, it is common for children to go deaf due to a build-up of fluid behind the eardrum. This is called glue ear and can be treated by inserting grommets. These are tiny ventilation tubes that sit across the eardrum and stop fluid from accumulating. The operation cures the hearing loss almost immediately.

The Bonebridge device

An advancement in hearing aids



The external microphone/sound processor in the new Bonebridge device.

Very rarely, children might be born without hearing nerves to carry the electrical impulses

Surgery for inner ear tumours

Acoustic neuromas are uncommon, benign inner ear tumours that grow next to the brain and which can cause deafness, tinnitus and imbalance. The Manchester Skull Base Team, of which Mr Lloyd is a member, is one of the UK's most experienced teams in managing this type of tumour, treating well over one hundred acoustic neuromas each year. Small and medium-sized tumours can be monitored using MRI scans as many do not grow. However, larger ones or those that grow should either be removed or treated with radiotherapy.

'We are just starting to understand what controls the growth of these tumours,' says Mr Lloyd. 'In some cases, there are medicines available now which effectively control tumours that are growing.' This avoids the need for surgery or radiotherapy. Acoustic neuroma surgery is very complicated and requires the combined expertise of neurosurgeons and ENT surgeons.

Other procedures available at the clinic

- Grommet insertion for the treatment of glue ear
 - Tympanic membrane repair and mastoidectomy for the treatment of chronic ear infection
 - Hearing restoration surgery using artificial hearing bones or cochlear implantation
 - Sinus surgery and voice surgery
 - Functional and cosmetic rhinoplasty
 - Surgery for the treatment of Meniere's disease
- Most of these procedures can be performed without needing an overnight stay in hospital.

All the treatments mentioned in this article are available at the Manchester Ear Nose and Throat Clinic. To contact Mr Lloyd please call 0161 434 9715 or email mrllloyd@manchester-ent.co.uk

For further information visit the website www.manchester-ent.co.uk

