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Digital Hearing Aids
What you need to know about digital hearing aids
Digital Hearing Aids

What you need to know about...
To find out more about loops, have a look at our factsheet ‘The Loop System - A Guide for Hearing Aid Users’.

Different types of hearing aids
Hearing aids are described as analogue or digital, depending on the technology they use to process sound. Digital hearing aids are the newest kind of hearing aids. The following types of aid are available as digital or analogue except for body-worn and bone-conduction aids, which are analogue only. Your audiologist or hearing aid audiologist will advise you on the most suitable type for you.

Behind-the-ear (BTE) hearing aids
These have an earmould which sits inside your ear. The hearing aid rests behind your ear and a plastic tube connects it to the earmould. These are better for people who suffer from humidity in the ear canal or need a lot of power.

In-the-ear (ITE) and in-the-canal (ITC) aids
These have their working parts in the earmould, so the whole aid fits into your ear. They tend to need repairing more often than behind-the-ear aids. Some in-the-ear aids can be seen from the side. The smallest in-the-canal aids fit right inside your ear canal, where they can't be seen at all. If you have severe hearing loss, or very narrow ear canals, these aids will probably not suit you.

Body-worn hearing aids
These have a small box which contains the microphone and working parts that you clip to your clothes. It is connected by a lead to an earphone clipped into your earmould. They may be suitable if you have sight problems, or problems using very small switches or buttons. Some models are very powerful.

Open On-the-Ear hearing aids
These are a small light inconspicuous hearing aid which fit on top/behind the ear. It introduces sound through a very fine tube into the ear canal without blocking it. These are only available as digital and are used mainly for mild high frequency losses.
What size are digital hearing aids?
Digital hearing aids – just like analogue ones – come in ‘behind-the-ear’, ‘in-the-ear’ or ‘in-the-canal’ models. They are not necessarily smaller than analogue hearing aids. Some people find them easier to put in and take out. See Different types of hearing aids earlier for more information.

Bone conduction hearing aids
These are for people with conductive hearing loss, or people who can’t wear a conventional hearing aid. They deliver sound through the skull by vibrations. These can be fitted to a special headband or built into spectacles. Another type, called the bone-anchored hearing aid (BAHA), involves having a small operation behind the ear.

CROS/BiCROS hearing aids
These are for people with hearing in one ear only. CROS hearing aids pick up the sound from the side without hearing and feed it to the better ear. This ensures that you don’t miss sounds on your deaf side. BiCROS aids amplify sound from both sides and feed it (by wire or radio signals) into the ear that has some hearing.

Waterproof hearing aids
Waterproof and water resistant aids are also available in a limited range.

How do analogue hearing aids work?
Analogue hearing aids have a microphone that picks up sound and converts the sound into small electrical signals. These signals vary according to the pattern of the sound. The signals are then amplified (made louder) by transistors and fed to the earphone or receiver on the hearing aid so you can hear them.

Most of the better analogue hearing aids compress the sound using ‘automatic gain control’ (AGC). This amplifies quiet sounds until they are loud enough to be heard, but gives less amplification to sounds that are already loud, so you’re protected against uncomfortably loud sound levels. Analogue hearing aids don’t have all the features that come with digital aids, but they are the least expensive hearing aids available.

Most manufacturers have ‘phased out’ analogue instruments as the cost of digital products reduces. Digital aids now cover the full range from basic to premium. The cost varies with processing power and other features.
How do digital hearing aids work?
Digital aids work in a different way. They take the signal from the microphone and convert it into ‘bits’ of data – numbers that can be manipulated by a tiny computer in the hearing aid. This makes it possible to tailor and process sounds very precisely, in ways that are impossible with analogue aids. The better digital aids can be very finely adjusted to suit your individual needs. You may also be able to switch between different settings suitable for different listening conditions. Many digital aids even adjust themselves automatically to suit different sound environments.

Cutting out background noise
When someone talks to you, you usually want to hear what they are saying, rather than whatever noise is going on in the background. People who use traditional analogue hearing aids often complain that they find it difficult or impossible to follow conversations in noisy places.

Many digital aids are designed to reduce steady kinds of background noise, such as the rumble of traffic or the whirr of a fan. This makes listening more comfortable. Some aids can distinguish between speech and noise and focus more on speech. When speech is no longer present they can go into a ‘quiet’ mode and tune in when speech starts again. This technology does not always help you to pick out a single voice from everything else that’s going on, especially when several people are talking.

Two things have been shown to improve hearing in noisy situations more than anything else – wearing hearing aids in both ears, and using hearing aids that are ‘directional’.

What are directional aids?
Directional hearing aids contain two microphones or a single modified microphone. The hearing aid picks up sounds that come from in front of you much better than sounds to the side or behind you, making it easier for you to focus on what you want to listen to in a noisy place.

You can switch between directional and all-round sound, depending on what you need to hear at the time. Some aids switch directionality automatically.

Can digital aids help reduce whistling?
Yes. Some digital hearing aids have ‘acoustic feedback suppression’ or – better still – ‘feedback cancellation’. This means that they can automatically reduce the whistling that bothers many people who use hearing aids. With some high frequency or severe hearing losses feedback will occur when you block your ear, for example put your hand up to the hearing aid.

More comfortable listening
Many digital hearing aids have a feature called ‘wide dynamic range compression’ that can be adjusted separately in each of several ‘bands’ and ‘channels’. It means the aid can be programmed to suit your particular hearing loss and ensures that you always hear different sounds at levels that are comfortable for you. This type of aid is often completely self-adjusting but can also incorporate a volume control or remote control.

It will only work well for you if the person who fits it also adjusts the settings carefully. Further fine-tuning appointments will be necessary after you are used to your hearing aid or aids.

Some types of analogue aid can also be programmed to suit individual users, but the way loudness is controlled in these aids is less sophisticated than in multi-channel digital aids. These types of aid may not always give as comfortable listening as digital aids.

What is the ‘T’ setting?
It’s usually possible to switch to ‘T’ with a digital hearing aid, as it is with an analogue aid. But your audiologist will need to set this up and show you how to switch over. The ‘T’ setting allows you to pick up sound from a loop system or inductive coupler. But if you choose a very small style of analogue or digital aid that fits into your ear canal, there might not be room for a telecoil, so you won’t have the ‘T’ option and you will not be able to use them with a loop system.