HEARING MATTERS AUSTRALIA
Support from real life experience

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HEARING TECHNOLOGY 101

The information provided below will introduce you to basic concepts in hearing technology. The information will help you discuss your needs and understand what options your audiologist or audiometrist suggest for you. We do not recommend purchasing hearing technology without a professional prescription, which should be dispensed as part of a rehabilitation program.

Hearing technology does not make your *hearing* better – it only improves your overall *listening experience* by amplifying and filtering sound that reaches your ears.
When sound is filtered and amplified according to your individual needs (dictated by your individual type and degree of hearing loss), you will find conversations easier in both quiet and background noise and will find you are less tired and more willing to engage with others.
Hearing technology is most effective when used regularly and as part of a rehabilitation program that includes also adjusting your environment and learning the communication strategies that are needed by you and those you communicate with.

Hearing technology is a broad class of devices that includes hearing aids, implantable devices, personal amplifiers (otherwise known as an over the counter devices) and assistive listening devices.

Hearing Aids

Hearing aids are electronic devices worn either behind or inside the ear.
All hearing aids have one or more microphones that pick up sound; amplifiers and filters; and receivers (or speakers) that transmit the modified sound. Hearing aids are set to amplify to different levels, across different frequencies and can be matched using software, to suit a range of types of hearing loss. Hearing aids are fitted specifically to either the left or right ear, and in most cases the way the aid is attached (coupled) to the ear is custom made. Hearing aids, when correctly inserted, should not fall out or whistle. Some hearing aids are analogue, but the majority are now digital, which allows for more options within the device.

All hearing aids are powered by some form of battery.
Disposable batteries in hearing aids are “button” batteries that require regular replacement. Button batteries must be disposed of very carefully as they are dangerous if consumed. Button batteries may be very difficult to handle without dropping.

Rechargeable hearing aid batteries that do not need removal from the hearing aid are increasingly common. They may seem easier to manage that disposable batteries. However, it is important to understand how to operate the recharging unit and the hearing aid may turn off during the recharging process.

Features available in most hearing aids

Hearing aids may look identical on the outside, but have very different features activated inside. Identifying features requires connecting hearing aids to the manufacturer's software, usually requiring specialised equipment that is available only to audiology clinics.
Features that may be in hearing aids include the following:

Directional microphones allow sounds from one or more directions to be picked up and amplified, with sounds outside of the set field not modified.

Direct Audio Input (DAI) allows for directly plugging in a microphone (that can be corded and placed in front of a speaker) or FM system (which receives a radio signal from a dedicated transmitter). Everyday devices like radios, TVs, computer speaker outputs and MPS MP3?? players can connect directly into hearing aids that have DAI capability.

Volume control on hearing aids is often set to automatically adjust, based on the level of sound coming into the hearing aid. Volume is usually also adjustable either on a button on the hearing aid itself, through a remote control that is specific to that hearing aid, or through an app that is loaded to a smartphone.

Feedback management controls feedback that results from amplified sound escaping from the ear and being reamplified – causing a whistle that is audible to others. Hearing aids fitted correctly and using current technology should not produce any feedback.

Telecoil or T-Switch picks up magnetic signals from devices or environments that have loop systems. In some cases the loop system must be manually turned on or connected to a microphone before the telecoil function in a hearing aid will be effective. Telecoil programs (or the older term 'T- switch') are fairly common in hearing aids, but looped devices and environments are increasingly rare, as connectivity shifts to WiFi and Bluetooth. Many hearing aids will connect to smartphones so that phone calls can be answered easily using the hearing aid controls, with no need to remove the hearing aid to use the phone.

Wireless/Bluetooth technology connects directly to smart phones, music players and TVs for making adjustments on hearing aid apps specific to the device, audio streaming, and phone calls. Learning to use hearing aids with apps and smart technology is important to get the most out of hearing aids and is an important aspect of rehabilitation. The audiologist will guide you as to which apps are appropriate and can gradually introduce new options if required.

Listening programs- hearing aids usually have multiple settings that can be preset. These can usually be accessed automatically or manually. For ease of operation, and where the environment remains the same most of the time, some programs can be turned off by the audiologist, using manufacturer's software.

Hearing Aid Styles

A range of hearing aid styles are available. The style of hearing aid will depend on several factors including:

- Shape and size of the individual ear
- Technology requirements – features needed and power required

The most popular hearing aid style is the Receiver in the Canal (RIC) style because the device usually fits very neatly into most ears, is large enough to include a range of features and is relatively easy to manage and maintain.

The style of hearing aid should be based on the prescription from the audiologist. An unsuitable style will compromise the benefit obtained from hearing aids.

Personal sound amplifiers (PSAP) or Over the Counter (OTC) devices

Devices are available that can be bought over the counter or over the internet that do not require programming to a specific hearing loss. They are aids to listening that can be helpful in the earliest stages of hearing loss. A hearing assessment prior to purchasing a device that does not require a prescription is highly recommended so that an informed choice about buying an over-the-counter device is made. In some cases, your audiologist may guide you to use a PSAP as a first step and may indicate to you which is the better device for you to use.

Implantable hearing technology

Implantable hearing devices are suitable for certain types of hearing loss, in people who are candidates for surgery. Usually, implantable hearing devices are considered when hearing aids offer limited benefit. Implantation of hearing devices requires a team of audiologists and surgeons.

Cochlear Implants consist of a surgically inserted ray of electrodes that are placed into the inner ear, and directly stimulate the hearing nerve. Sound is transmitted to the electrodes via an external processor that includes a microphone and device that attaches to the head via a magnet. Cochlear implants may be provided for one or both ears. Cochlear implants connect to other types of hearing technology. They can be transformative for those who are unable to benefit from hearing aids.

Bone Anchored Hearing Devices consist of a connector that is surgically inserted into the bone behind the ear, that connects to a hearing aid that stimulates hearing by bone conduction. Certain ear conditions are suited to bone anchored devices.

Assistive Listening Devices (ALDs)

Assistive listening devices can be used together with other forms of hearing technology, or as stand-alone devices. Assistive listening devices help make everyday listening easier such as Bluetooth or WiFi headphones for TV. Alerting devices include suitable alarm clocks, smoke alarms, doorbells.