



Choosing a Hearing Aid

WHAT DOES A HEARING AID DO?

A hearing aid amplifies sounds so that they are audible but not uncomfortably loud. It should be selected and set up to meet personal needs and degree of hearing loss.

Most sounds such as speech are made up of a range of different frequencies; for example, low frequency sounds such as vowels and high frequency consonant sounds. Different patterns and degrees of hearing loss will affect a person's ability to hear different frequencies.

Generally speaking, as you get older your hearing deteriorates in the higher frequencies making the consonant sounds in speech more difficult to hear. This often leads to a situation where it is possible to hear that *something* is being said, but difficult to understand clearly *what* has been said. This is particularly true in background noise.

A hearing aid is designed to cope with the sounds that make up speech and should be selected to provide more amplification in the frequencies where they are needed most in order to optimise speech understanding.

DO I NEED A HEARING AID?

Most hearing loss occurs very gradually and you may not be aware that your hearing is deteriorating. Any of the following pointers may indicate that you might benefit from having your hearing tested and being fitted with a hearing aid:

- You are beginning to find it difficult to hear conversation when you are in a group.
- You occasionally miss the telephone or doorbell.
- You complain that people are mumbling and not speaking clearly.
- You have to turn up the TV or radio volume louder than you used to or is acceptable for other family members or friends.

If your hearing is noticeably worse in one ear and/or you have tinnitus (noises in the head), you should mention this to your GP.

WHAT TYPES OF AID ARE AVAILABLE?

There are a number of different types of hearing aid.

Behind-the-ear (BTE) aids are the most common type in Europe and are available both through the NHS and commercially. The hearing aid sits behind your ear and the sound is directed into your ear canal via a custom made earmould. Some BTE models can be fitted onto the arm of your spectacles.

In-the-ear (ITE) aids fit entirely into the ear, filling the entire external part of the ear but with no components sitting behind the ear. Smaller versions of these fill only a small part of the external part of the ear, and are known as ***in-the-canal*** (ITC) hearing aids. Even smaller versions sit entirely in the ear canal, and are known as **completely-in-the-canal** (CIC) hearing aids. ITE and CIC hearing aids are not suitable for all degrees of hearing loss. They may be available through the NHS, depending on local policy, and are widely available from private hearing aid dispensers.

Body-worn (BW) aids consist of a small chest worn unit with a lead connecting this to an earphone and earmould. Because of their size, these aids are easier to operate than other types, and can provide higher amplification. BW aids are available through the NHS and commercially but are now less common than other types of aid.

HOW DO I GET A HEARING AID ON THE NHS?

NHS hearing aids are available free of charge to anyone who is a UK citizen or resident in the UK that has a hearing problem and could benefit from a hearing aid.

If you believe your hearing has deteriorated, the first step is to see your family doctor. Your doctor may be able to help by removing wax from your ears or by prescribing medication. However, if this alone does not improve your hearing, s/he should refer you to the appropriate specialist. If you are over 65 years old and meet a set of specific criteria determined by your doctor you may be referred directly to the Audiology or Hearing Aid department. If you are under 65 years old or do not meet the direct referral criteria, your GP will refer you to an Ear, Nose and Throat (ENT) consultant who may then refer you on to the Hearing Aid department after a medical consultation. All NHS ENT and Audiology departments will have a waiting list, the length of which will vary depending on where you live.

Usually you will attend an outpatients' clinic where a medical history will be taken, your ears will be examined and your hearing tested. An audiologist will carry out an assessment of your hearing in a sound proof room. These tests are simple to perform and will help to determine whether you are suitable for a hearing aid. If this is the case, the audiologist will discuss this with you, and determine whether one or both ears should be fitted. The audiologist will then take an impression of your ear or ears so that an earmould can be custom made. You will be asked to return, usually several weeks later, for the aid(s) to be fitted. Your aid(s) will be chosen to suit the degree and type of hearing loss you have.

At your fitting appointment, the audiologist will show you how to insert and maintain the earmould and hearing aid, how to operate the controls and how to change the batteries. You will be given advice to help you get used to using your aid and to help you obtain the most benefit from it.

A follow-up appointment will be arranged for you, typically at around 6-12 weeks after your fitting appointment. At the follow-up you can discuss any problems you may be experiencing with the audiologist. Any necessary adjustments will be made to the earmould and/or the aid and you may be given further information and advice about getting used to the aid(s) or maintaining the aid(s).

WHAT SUPPORT IS AVAILABLE ONCE I'VE RECEIVED MY AID?

It is important to allow yourself sufficient time to get used to your hearing aid and to try it in different situations in order to get the most benefit. Particularly if your hearing has gradually deteriorated over many years it may take many weeks or months to adjust to the new sounds you are receiving from your hearing aid. It is important to remember that a hearing aid is an **aid** to hearing and will not restore perfect hearing in the way that glasses can restore perfect sight. So, whilst it is important to keep trying, your expectations should be realistic. A hearing aid should give you maximum benefit in quiet environments such as listening to the television or 1:1 or small group conversations. You may notice more limited benefits in very noisy situations.

After your final follow-up appointment you are unlikely to be sent another appointment to see an audiologist unless you request one. You generally don't need an appointment to obtain batteries for your hearing aid. These are supplied free of charge from your local audiology department and may also be available from local GP surgeries and Health Centres. If your hearing aid or earmould needs repairing you may or may not need an appointment for this depending on local policy.

If you are still having difficulties with your hearing aid after your final follow-up appointment, support is available from a number of areas.

- In the first instance you should contact your audiology department to arrange a further follow-up appointment with an audiologist. They will discuss your problems with you and may adjust or change your hearing aid(s), offer advice and information or may refer you elsewhere for further help.
- Your audiology department may run group communication courses, which you can attend. These can have many functions including group discussions, information about improving communication skills, counselling, etc.
- At some centres, a Hearing Therapist may be available to offer further help and advice regarding your hearing problems.

- You may be referred to Social Services who will assess your situation and may provide additional equipment, which can help you in specific listening situations. This could include devices that will alert you to your doorbell or telephone.
- Many hard of hearing people find lipreading a great benefit and you can obtain details of local lipreading classes from the Association of Teachers of Lipreading to Adults or from your local audiology department.

HOW CAN I OBTAIN A HEARING AID PRIVATELY?

Hearing aids may be obtained either through the NHS or privately. Having a private aid does not affect your right to free NHS provision.

A small number of hospitals now offer a private dispensing service which, like every private dispenser, is subject to the Hearing Aid Council Code of Practice. It is not possible to obtain financial assistance towards the private purchase of a hearing aid from a hospital dispenser or private dispenser.

Hearing aids are sold by hearing aid dispensers, not directly by manufacturers. There are several hundred dispensers operating throughout the country and all must be registered with the Hearing Aid Council (HAC). The HAC is not a consumer "watchdog" but its Code of Practice does help protect your interests.

The Hearing Aid Council:

- Can check the status of a particular dispenser for you.
- Can provide copies of the HAC Code of Practice.
- Can fine dispensers that break the HAC's regulations. In extreme cases, a dispenser may be struck off the register and will then be unable to practice.
- Cannot recommend particular dispensers or hearing aids.
- Cannot secure refunds.

Before you visit a dispenser, it is sensible first to visit your family doctor. Although the dispenser will not require a referral from your doctor, s/he should examine your ears before your visit. The dispenser is unlikely to be medically trained and your doctor will pick up any relevant medical problem. In most cases, the dispenser is required to advise you to seek medical advice if you have not already done so and to recommend a medical referral if this is indicated.

Although all have to follow the HAC code, standards do vary so you need to choose your dispenser with care. Remember this is your main protection against dissatisfaction. Once you have entered into an agreement to buy an aid, it may not be possible to obtain a refund if you are dissatisfied.

Home visits are not advised, though the HAC Code does permit home visits if all the following conditions are met:

- you have previously requested information or assistance
- you have been provided with a pre-paid card or envelope enabling you to decline the offer of a visit

- no charge is made for the visit
- you are offered a 7 day free trial / money back period.

However, a 7 day return period may not be sufficient. If you obtain your aid privately, the cost is likely to be high and it is important to know how you are going to get on with your aid in different situations. You will also need to get used to your aid. A free trial period, preferably of about 30 days, is therefore essential. If you ask for a money-back agreement of this kind and the dispenser will not agree, offering only a guarantee for repair, go elsewhere. However, many dispensers will want to make a non-refundable charge for the cost of making an earmould or a custom-made shell for an ITE aid.

Before a hearing aid can be sold to you, you should normally expect the dispenser to conduct some sort of hearing test. The HAC code requires them to do so unless they have access to an audiogram carried out within the previous two months by, or under the supervision of, an ENT specialist.

Before you purchase, you should also expect to have written details of certain aspects of the sale. These are:

- the terms of any guarantee
- the conditions relating to any trial period/money back agreement
- the cash price plus any additional charges
- purchase options
- terms and conditions under which the order may be cancelled
- the servicing arrangements.

Remember, once you sign an agreement to buy an aid you are entering into a legal contract. So, read all documents very carefully and if you are unhappy or unsure about anything do not sign.

The key points to remember when buying an aid privately are:

DO

- try to use a dispenser who has been recommended by a friend or relative
- use a locally based dispenser - it might pay to shop around to get the best price and service
- arrange an appointment at the dispenser's consulting rooms, not at home
- take someone who has good hearing with you
- make sure you can have the aid for a free trial / money back period (preferably lasting at least 30 days)
- arrange an after care appointment within about 6 weeks of fitting the aid as your aid may need further adjustment to achieve the best results

DON'T

- buy your aid at an exhibition or through an advertisement
- have a home visit unless you must

If you are dissatisfied with your private aid, return to your dispenser. If you are still unhappy, you should write to the Hearing Aid Council giving details of the problem and the dispenser/company that sold you your aid. Enclose copies of any correspondence.

SHOULD I HAVE ONE AID OR TWO?

If you have a hearing impairment in both ears, then you will generally do better if both ears are fitted with hearing aids. Two hearing aids can help with sound localisation (telling the direction that sounds are coming from) and they can also improve the ability to understand speech in noisy situations. On the NHS, most people are initially fitted with one hearing aid but the option of having a second aid should be available to you provided this is appropriate. You may need to be insistent about this – don't immediately give up if you are told "we usually only fit one aid".

WHAT ARE THE LATEST DEVELOPMENTS IN HEARING AIDS?

Analogue Hearing Aids

An analogue hearing aid uses conventional electronics to amplify sounds. In these aids a microphone picks up sound, which is amplified and reproduced by a miniature loudspeaker (receiver). Most analogue hearing aids have some means of limiting the loudest sounds coming from the aid so that loud sounds are not uncomfortably loud for the listener. Many analogue aids amplify soft, mid level and loud sounds by the same amount (linear amplification). Other forms of analogue aid use compression (non-linear amplification) to amplify soft sounds more than mid-level or louder sounds.

In some compression aids the amplification operates independently in two or more frequency ranges, called "bands" or "channels". This can be advantageous for a person whose amount of hearing loss varies with frequency. A range of analogue aids are available privately and through the NHS.

Digitally Programmable Hearing Aids

These are analogue aids that use a digital memory to select between various settings or programmes. This makes it much easier for the audiologist to provide the user with a range of suitable settings for different listening environments e.g. listening in quiet, listening in noise, listening to music etc. In many models, the user can select the appropriate programme for a given listening situation using a remote control.

Digital Hearing Aids

In truly digital aids, the sound is converted from an analogue to a digital form. In this form, a series of numbers represent the electrical signals, to which it is possible to apply mathematical techniques. The digital signals are then converted back to analogue form and sent to the receiver. This makes processing of the sound much more flexible and allows the sound to be manipulated in ways that would be difficult or impossible with analogue aids.

Digital hearing aids generally include several features that may not be found in analogue aids. These include:

- They are potentially more versatile and flexible than simpler analogue hearing aids. Digital hearing aids typically have 2 or more channels allowing the hearing aid response to be tailored to meet the person's requirements.
- Sophisticated ways of reducing acoustic feedback (the annoying whistling sound that occurs when the sound generated by the aid leaks back to the aid microphone).
- Noise reduction algorithms designed to improve listening comfort in background noise. However, these do not usually improve speech intelligibility.
- Directional microphones with enhanced directionality and the ability to adapt to changes in the location of the background noise. These can improve the ability to understand speech in noisy situations. Often, it is possible to switch the directionality on and off.

One potential problem with digital hearing aids is that they introduce a slight delay in the sound being heard, typically between 1 and 10 milliseconds (thousandths of a second). Usually, this small delay is not noticeable. However, if a single digital aid is fitted, the time difference of the sound at the two ears may disturb the wearer's ability to localise sounds. Therefore, it is recommended that digital aids of the same type are fitted to both ears.

Directional Microphones

Several models of analogue and digital hearing aids incorporate directional microphones. These selectively amplify sounds coming from the front, while sounds coming from the sides or rear are amplified much less. In many noisy situations, if the user looks at the person they want to hear, the directional microphone can help them to pick out the desired voice from the background noise. Directional microphones are available in both behind-the-ear and in-the-ear hearing aids (but not in completely-in-the-canal hearing aids). A hearing aid with a directional microphone should also offer the user the option to switch between a directional microphone and a conventional omni-directional microphone, with a button or switch on the aid or via a remote control. The omni-directional microphone will be more useful in most everyday situations where it is important to hear sounds from all around, whilst the directional microphone will be predominantly used in noisy listening environments.

Bone Anchored Hearing Aids

A bone anchored hearing aid is helpful to people who are unable to use a conventional aid. This may be for a variety of reasons, such as if the patient's external ears are absent or malformed, or if they have a disease that regularly causes the ears to discharge. It is estimated that some 30,000 people are in this category.

These aids work by transmitting sound through the bones of the skull to the nerves of the inner ear.

The aid is attached to a small titanium peg, which is screwed into the mastoid bone behind the ear. The operation is quite simple and is carried out under local anaesthetic. It takes about 30 minutes to perform. The peg is then left for three months to allow the bone to grow back, locking the peg firmly into place, after which a plastic socket is attached. The bone anchored hearing aid fits onto this, and can be easily removed for sleeping or bathing.

WHAT RESEARCH IS BEING CONDUCTED ON HEARING AIDS?

The development of the new generation of digital aids

Thanks in part to the support of Deafness Research UK, the new generation of digital hearing aids is beginning to overcome many of the problems associated with traditional aids. The new aids, incorporating miniature computers, can better compensate for the effects of loudness recruitment and reduced frequency selectivity, helping the user to pick out the sound of speech. However much remains to be done to develop new processing methods to overcome the problems of sound distortion and speech discrimination, research which Deafness Research UK remains committed to.

Improving evaluation and fitting procedures

Less than half of all people with a hearing impairment actually wear a hearing aid, and those who do find that their hearing is not restored to normal. One reason for the poor take-up of hearing aids is that the aids are often not adjusted accurately to suit the individual's needs. In addition, traditional hearing aids of the type often dispensed by the NHS in the past may not be capable of being adjusted sufficiently.

Deafness Research UK scientists are therefore working to develop and evaluate new fitting procedures that will be applicable to the next generation of hearing aids. The procedures are designed to be efficient and simple to use and to give good results in a wide variety of everyday listening situations.

Currently we have a research team working to develop better clinical methods to help accurately identify 'dead regions' in the inner ear. In these regions the hair cells that detect sound are completely non-functioning.

This enhanced diagnosis of hearing loss will avoid amplifying sounds detected by the dead regions, which further impairs speech discrimination, therefore improving prescription and tuning of hearing aids. In cases where individuals

will get very little benefit from hearing aids, the accurate diagnosis of dead regions will offer a clearer basis for assessing whether that person should be a cochlear implant candidate.

Developing more effective sound processing technologies

In everyday life, variations in pitch give a sense of melody in musical sounds and help convey the intonation of the voice for speech sounds. Researchers have shown how hearing-impaired people can experience a variety of changes in the way that they perceive the pitch of single 'pure' tones, but much less is known about the perception of complex tones, such as those produced by musical instruments or the human voice.

Deafness Research UK scientists are currently studying ways in which the perception of these complex tones is affected by a hearing impairment, with the aim of improving our understanding of the hearing mechanism. Eventually, researchers hope this work will lead to the development of hearing aids that can more effectively compensate for problems in understanding the human voice and other complex sounds.

WHO SHOULD I CONTACT FOR MORE INFORMATION?

For information about private hearing aid dispensers contact:

Hearing Aid Council

The Hearing Aid Council
70 St Mary Axe
London EC3A 8BD
Tel: 020 3102 4030
Website: www.thehearingaidcouncil.org.uk
Email: hac@thehearingaidcouncil.org.uk

British Society of Hearing Aid Audiologists

Mrs Jill Margaret Humphreys
9 Lukins Drive
Dunmow, Essex CM6 1XQ
Tel: 01371 876623
Website: www.bshaa.com

For information about lipreading contact:

Association of Teachers of Lipreading to Adults

Westwood Park
London Road
Little Horkesley
Colchester
CO6 4BS
Website: www.lipreading.org.uk Email: ATLA@lipreading.org.uk

For information on the **Access to Work** scheme, a government-run scheme giving support to disabled people and employers, contact your local Disability Service Team through your local Jobcentre: www.jobcentreplus.gov.uk.

Deafness Research UK is the only national medical research charity dedicated to helping people with deafness, tinnitus or other hearing problems.

Scientists are now predicting that within the next ten to fifteen years there could be a cure for some forms of deafness and much more effective treatments for tinnitus. Deafness Research UK is at the forefront of this work.

You can support us by making a donation or joining the Deafness Research UK League of Friends. For more information call us on 0207 833 1733 or write to:

Deafness Research UK, 330-332 Gray's Inn Rd, London WC1X8EE
Charity no. 326915

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