

Our friendly helpline team is waiting
to answer your call or email.

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www.actiononhearingloss.org.uk

ACTION ON
HEARING
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Bone conduction hearing aids

THE FACTS

Bone conduction hearing aids

This factsheet is part of our **Hearing aids** range. You will find it useful if you have hearing loss and want to find out about bone conduction hearing aids.

You should read this factsheet to find out:

- What are bone conduction hearing aids?
- How do conventional hearing aids work?
- How do bone conduction hearing aids work?
- Who are bone conduction hearing aids suitable for?
- What are traditional bone conduction hearing aids?
- What are bone anchored hearing aids?
- Where can I get further information?

If you would like this factsheet on audio tape, in Braille or in large print, please contact our helpline – see front page for contact details.

What are bone conduction hearing aids?

Bone conduction hearing aids are like conventional hearing aids – they help you to hear – but they work in a different way. They are especially designed for people who cannot wear conventional hearing aids.

How do conventional hearing aids work?

Conventional hearing aids make sounds louder and deliver them to the ear canal. The earmould or hearing aids generally fit the ear canal closely so that only sound from the hearing aids enters the ear. The amplified sounds are then heard normally through a process known as ‘air conduction’.

When you hear, sound passes along the ear canal to the eardrum making it vibrate. This is what is meant by ‘air conduction’. These vibrations are passed to three small linked bones in the middle ear. The small bones then carry the vibrations to the cochlea (inner ear) and the fluid within it. Movement in this fluid bends tiny hair cells along the length of the cochlea, generating signals in the auditory nerve. The signals travel along the nerve to the brain, which interprets them as sound.

For more information about how your ears work, see our leaflet about looking after your hearing and see the diagram of the ear on the next page.

Diagram of the ear

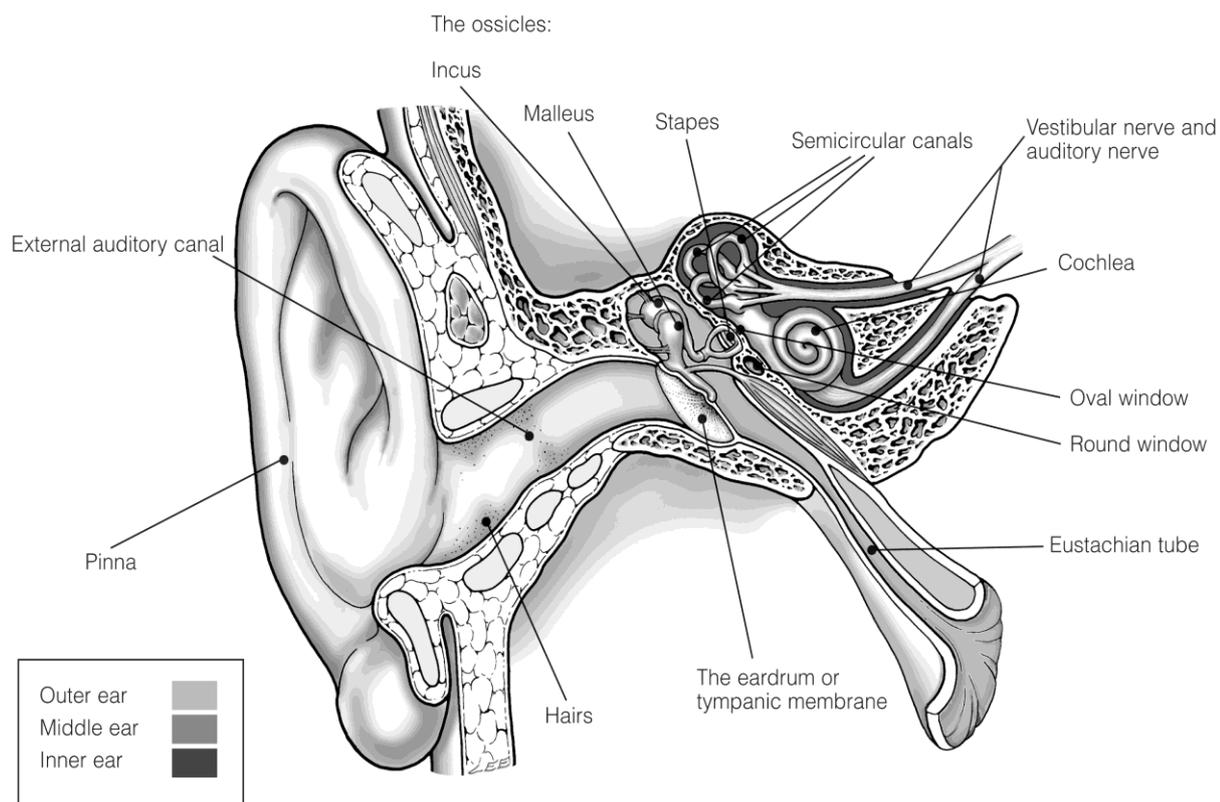


Diagram: Gillian Lee Illustrations

How do bone conduction hearing aids work?

Bone conduction hearing aids work differently. They also make sounds louder but the sound is not passed into your ear canal. Instead, the aid conducts – or carries – sound through the bone in your skull. This process is known as ‘bone conduction’. You hear when the sound vibrations are transmitted directly from the vibrating part of the bone conduction hearing aid through your skull to the cochlea, missing out the outer and middle ears.

Hearing through bone conduction is not as efficient as hearing through air conduction. However, bone conduction hearing aids are an option for people who cannot use conventional hearing aids.

Who are bone conduction hearing aids suitable for?

Bone conduction hearing aids are suitable for anyone who cannot wear conventional hearing aids in their ear canal because:

- They have continual infections or eczema.
- Part or all of their ear or ear canal is missing.
- Their ear canal is unusually small.

Once bone conduction aids are fitted, people usually find that they have fewer ear infections, less feedback and their ear canals are less sore than when wearing conventional hearing aids.

Bone conduction hearing aids are also suitable for some people with conductive hearing loss. Conductive hearing loss occurs when sound is prevented from reaching the inner ear, usually because of a blockage or abnormality of the outer or middle ear. Although bone conduction hearing aids can be suitable in these cases, conventional hearing aids are often the best option for many people with middle ear problems, so they tend to be tried first.

Two main types of bone conduction hearing aid are available:

- Traditional bone conduction hearing aids.
- Bone anchored hearing aids.

What are traditional bone conduction hearing aids?

Traditional bone conduction hearing aids consist of an aid worn on the body and a bone conductor or vibrator fitted to a removable headband. The headband holds the vibrating part tightly to your head, so these aids can be uncomfortable to wear and can sometimes give you headaches and sore skin because of the pressure of the headband.

An alternative method is to fit the bone conductor to the arm of a pair of specially strengthened spectacles instead of a headband. There is also a type of aid that has a behind-the-ear hearing aid attached to the headband and bone vibrator.

Who are they suitable for?

Traditional bone conduction hearing aids are suitable for adults and children who cannot wear conventional hearing aids, whether this is a temporary or permanent restriction.

How do you get them?

If you have an ear infection or if you have difficulty hearing, you should see your GP. If your GP thinks you have a physical problem that needs further investigation, they will refer you to the Ear, Nose and Throat (ENT) department at a local hospital to get your ears checked. They may advise you to try traditional bone conduction hearing aids. These are available from the NHS, except those that need to be fitted to spectacles.

If you prefer, you can buy bone conduction hearing aids from a private hearing aid dispenser. For further information about buying hearing aids, see our factsheet **Buying hearing aids**.

What are bone anchored hearing aids?

Bone anchored hearing aids or BAHAs consist of a permanent titanium fixture or implant (instead of a removable headband), which is surgically inserted into the part of the skull bone that is behind your ear. This contains the vibrating part. A small detachable sound processor clips onto the fixture. BAHAs are now available with digital technology, although some models still use analogue technology.

Some BAHAs have additional features such as:

- A separate telecoil with a T switch so you can use induction loops.
- A separate audio adapter to give you direct input from your television, hi-fi system or personal stereo.

Diagram of an implanted BAHA

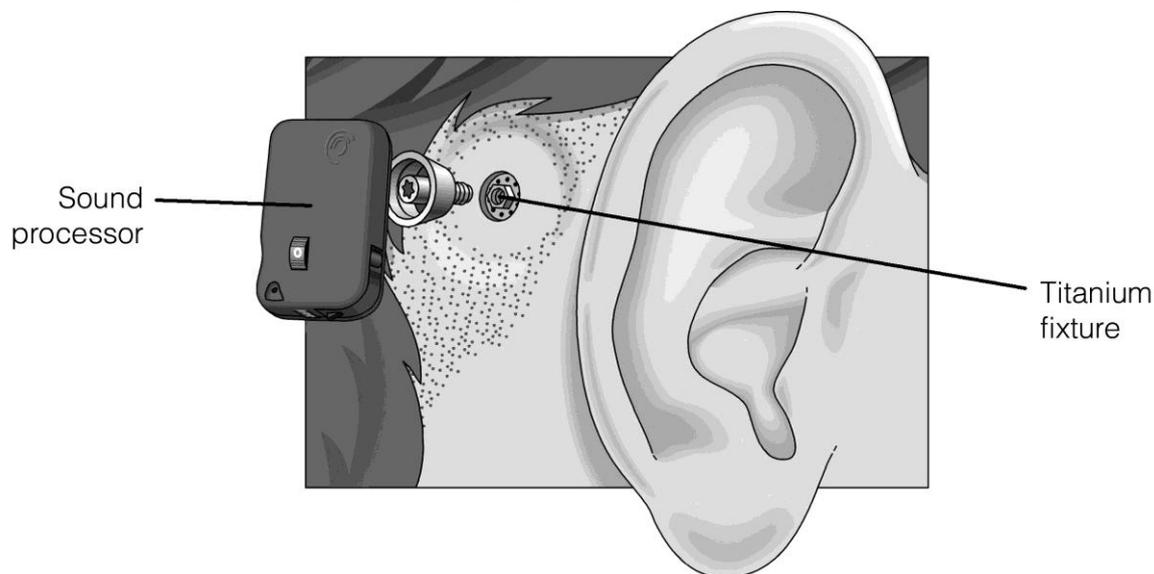


Diagram © Entific Medical Systems.

Who are they suitable for?

BAHAs are not suitable for everyone. You will only be advised to have one if you:

- Have abnormalities of the middle, outer or external parts of your ear, or a chronic ear infection or inflammation, which prevents you from wearing conventional hearing aids.
- Have hearing loss in both ears that cannot be operated on and for which conventional hearing aids are not suitable.
- Can hear sounds well via bone conduction.
- Can understand 60% or more of speech on a standard test, using bone conduction.
- Can keep the area around the fixture clean, either on your own or with help from other people.

Some bone diseases, for example osteogenesis imperfecta, may mean that your skull bone is too thin and so BAHAs would not suit you.

As part of your assessment, you may be asked to bite on to a test rod attached to a BAHA sound processor. If you hear the sound properly, BAHAs are likely to work for you because sound is conducted more efficiently through the skull than through teeth.

How do you get them?

You can get BAHAs free from the NHS, although they are not available in every hospital. This means you may have to travel some distance to get them. Your GP will refer you to your nearest hospital where you will be assessed to see if BAHAs would be suitable for you.

How are they fitted?

BAHAs are surgically implanted. Before surgery, the surgeon will discuss which side would be best for the implant depending on which ear you hear better with. If your hearing is similar in both ears and you drive a lot, it may be better to choose your left or passenger-side ear. Or, it may be better for you to choose the ear you usually use for the telephone.

Surgery is usually carried out in one or two stages under a local or a general anaesthetic. The standard procedure is to carry out both stages at once in adults and older children. However, this varies from hospital to hospital and depends on the surgeon. Each stage involves a minor operation that takes about an hour.

What happens during the first stage?

In stage one, a 3-4mm titanium implant is inserted into the mastoid bone, which is the part of the skull directly behind your ear.

What happens during the second stage?

If carried out separately, the second stage will be done three or four months after stage one. By this time the titanium implant should have bonded strongly to the skull bone. This is known as 'osseointegration'. During this stage, the implant will be connected through your skin to a small screw called a 'percutaneous abutment'. This is the vibrating part, which conducts sound through your skull bone to your inner ear.

About a month after the second stage – or longer if both stages of the operation were done at once – you will be ready to use the sound processor. You will be given an appointment at the hospital. You will be shown how to attach and remove the processor, which can be snapped on and off, how to use the controls on it and how to clean the area around the screw. You must keep this area clean, as daily cleaning reduces the risk of infection.

The external parts of the BAHAs will need to be replaced every five years – but you won't need to have any more surgery once the BAHAs have been implanted successfully.

What are the benefits of BAHAs?

People using BAHAs get a better quality of sound and hear more clearly than those with traditional bone conduction aids. Compared with traditional bone conduction hearing aids, BAHAs are lighter and less visible, more comfortable, use fewer batteries and are securely attached.

Remember that BAHAs – like all other hearing aids – will not restore your hearing, but they will improve your hearing in everyday life.

If you think help from other people who use BAHAs, you could contact a local BAHA support group – see below for details of how to find one.

Can children have BAHAs?

In the UK, children as young as three can be fitted with BAHAs. Children are more likely to dislodge the titanium implant as they have thinner bone and a more active life than adults do, so some surgeons routinely fit two implants in children so that there is a spare in case one fails. A new screw can then be inserted into the spare implant.

For more information about BAHAs for children, contact NDCS – see below for contact details.

Where can I get further information?

National Deaf Children Society (NDCS)

Supports children and young people who are deaf and their families in overcoming the challenges of childhood deafness.

15 Dufferin Street, London EC1Y 8UR

Tel/ textphone 0808 800 8880 Fax 0207 251 5020

helpline@ndcs.org.uk

www.ndcs.org.uk

The Ear Foundation

A range of information about BAHAs including equipment to use with your BAHA, news, events, case studies and the BAHA users support forum.

Marjorie Sherman House, 83 Sherwin Road, Lenton, Nottingham NG7 2FB

Telephone 0115 942 1985 Fax 0115 924 9054

<http://earfoundation.org.uk/baha/>

Further information from Action on Hearing Loss

Our helpline offers a wide range of information on many aspects of hearing loss. You can contact us for further copies of this factsheet and our full range of factsheets and leaflets – see the cover page for contact details.

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