

Information about Hearing Loss

Haywards Heath & District Probus Club



Why Hearing is Important

The UK charity [HearingLink](#) says: "As one of our most important senses, the ability to hear enables us to connect to the world for many very important, even vital, reasons. Most importantly, hearing connects us to people enabling us to communicate in a way that none of our other senses can achieve. As Helen Keller, the famed 20th century activist and educator once said: '*Blindness cuts us off from things, but deafness cuts us off from people.*' Although it's true that the greater the hearing loss, the more severely our ability to communicate is affected, the impact on daily life of milder forms of hearing loss should never be underestimated or ignored."

Personal development coach Dale Carnegie put the importance of hearing differently: '*Remember that a person's name to that person is the sweetest and most important sound in any language.*'

A person who cannot hear as well as someone with normal hearing – hearing thresholds of 20 dB or better in both ears – is said to have hearing loss. One in five of all adults and more than half of people over 60 have a hearing loss. It is estimated that there are approximately 11 million people in the UK*^{*}, after difficulty in mobility, lifting and carrying.

* Source: the now-defunct Prime Minister's Strategy Unit

Hearing loss can have a significant effect on your quality of life. Often, older people with hearing loss are mistakenly thought to be confused or unresponsive due to cognitive impairment. Their hearing loss might be mistaken as being uncooperative. Older adults with hearing loss may report feelings of depression. Because hearing loss can make conversation difficult, some people experience feelings of isolation. Hearing loss is associated with cognitive impairment and decline.

While it might seem that having good balance is a sign of physical fitness or brain health, balance actually begins in the ear. Most of the vestibular system, which helps you maintain balance, is located deep in your inner ear.



Picture Credit: [Public Domain] Audiological exam using an audiometer. This image is a work of the [National Institute for Occupational Safety and Health](#), part of the [Centers for Disease Control and Prevention in the United States Department of Health and Human Services](#), taken or made as part of an employee's official duties.



The International Symbol for Deafness

Caution: No advice is implied or given in articles published by us. This guide is for general interest only - and should never be used as a substitute for obtaining advice from an audiologist, otologist, your doctor or other qualified clinician/medical practitioner. The facts are believed to be correct as at the date of publication, but there may be certain errors and omissions for which we cannot be responsible.

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Hearing Loss

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The NHS ([HERE](#)) say that hearing loss can be temporary or permanent and often comes on gradually as you get older, but it can sometimes happen suddenly. You may also have other symptoms, such as an **earache**, hearing unusual noises in your ear (**tinnitus**) or a spinning sensation (**vertigo**). The NHS advice is that you should see a GP if you notice any problems with your hearing **in one or both ears** so you can find out the cause and get **treatment advice**. You can't reverse most types of hearing loss. However, you and your GP or an Audiologist or Otologist can take steps to improve what you hear.

Signs and Symptoms of Hearing Loss

It's not always easy to tell if you're losing your hearing. Common signs include:

- Difficulty hearing other people clearly, and misunderstanding what they say, especially in noisy places.
- Frequently asking people to repeat themselves.
- Muffling speech and other sounds and concentrating on hearing what other people are saying can be tiring or stressful.
- Difficulty understanding words, especially against background noise or in a crowd.
- Trouble hearing consonants.
- Frequently asking others to speak more slowly, clearly and loudly.
- Needing to turn up the volume of the television or radio.
- Withdrawal from conversations.
- Avoidance of certain social settings.
- Not hearing at all when someone speaks to you if they are a distance from you.

A GP can help if you think you're losing your hearing, when:

- You or your child suddenly lose hearing (in one or both ears), call a GP or **NHS 111** as soon as possible.
- You think your or your child's hearing is gradually getting worse, make an appointment to see a GP.
- You are concerned about a friend's or family member's hearing, encourage them to see a GP.

It's not always easy to tell if you've lost hearing in one ear, as you may still be able to hear with your other ear.

Signs of a hearing problem in one ear include:

- your hearing is worse when sound comes from one side
- all sounds generally seem quieter than usual
- finding it hard to tell where sound is coming from
- difficulty ignoring background noise or distinguishing different sounds
- finding speech unclear
- difficulty hearing in noisy places or over long distances

Hearing loss in one ear is often caused by sound temporarily being unable to pass through the ear – for example, because of **earwax** or an **ear infection**. The GP will ask about your symptoms and look inside your ears using a small handheld torch and a magnifying lens. The GP can also do some simple checks of your hearing and, if needed, can refer you to a specialist for more **hearing tests**.

Causes of Hearing Loss

Hearing loss can have many different causes, such as:

- sudden hearing loss in one ear may be due to **earwax**, an **ear infection**, a **perforated (burst) eardrum** or **Ménière's disease** (see below)
- sudden hearing loss in both ears may be due to damage from a very loud noise or taking certain medicines that can affect hearing
- gradual hearing loss in one ear may be due to something inside the ear, such as fluid (**glue ear**), a bony growth (**otosclerosis**) or a build-up of skin cells (**cholesteatoma**)
- gradual hearing loss in both ears is usually caused by ageing or exposure to loud noises over a long period of time

Ménière's Disease

Ménière's disease is a rare disorder that affects the inner ear. It can cause vertigo, tinnitus, hearing loss, and a feeling of pressure deep inside the ear. These symptoms arise during sudden attacks, which typically last around two to three hours, although it can take a day or two for the symptoms to disappear completely. The symptoms and severity of Ménière's disease vary widely from person to person. The unpredictable nature of the attacks and their restrictions on activities can lead to anxiety and depression. Read more about living with Ménière's disease, [HERE](#).

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Treatments for Hearing Loss

Hearing loss sometimes gets better on its own, or may be treated with medicine or a simple procedure. For example, earwax can be sucked out or softened with eardrops. But other types – such as gradual hearing loss, which often happens as you get older – may be permanent. In these cases, treatment can help make the most of the remaining hearing. This may involve using:

- Hearing aids – several different types are available on the NHS or privately.
- Implants – devices that are attached to your skull or placed deep inside your ear if hearing aids are not suitable.
- Different ways of communicating – such as **sign language** or lip-reading.

Picture Credit: "Music to my ears" by Keith Williamson is licensed under [CC BY-NC-ND 2.0](https://creativecommons.org/licenses/by-nc-nd/2.0/)



Sensorineural hearing loss (SNHL) is caused by damage to the structures in your inner ear or the auditory nerve. It is the cause of more than 90% of hearing loss in adults. Common causes of SNHL include exposure to loud noises, genetic factors, or the natural ageing process, there are several options that may help to improve a person's ability to hear and communicate. These include:

- digital hearing aids – which are available through the NHS
- bone anchored implants – suitable for people who are unable to use hearing aids and for some levels of sensorineural hearing loss
- middle ear implants – suitable for some people who are unable to use hearing aids
- cochlear implants – for people who find hearing aids aren't powerful enough
- lip-reading and sign language – such as British Sign Language (BSL)

Conductive hearing loss is sometimes temporary and can be treated with medication or minor surgery, if necessary. However, more major surgery may be required to fix the eardrum or hearing bones. If conventional hearing aids don't work, there are also some implantable devices for this type of hearing loss, such as Bone Anchored Hearing Aids (BAHAs).

Sometimes people can have a combination of both sensorineural and conductive hearing loss. They may have a sensorineural hearing loss and then develop a conductive component as well. A hearing test is critical to discovering exactly what type of hearing loss you have and will help determine the best hearing care solution for you.

Preventing Hearing Loss

It's not always possible to prevent hearing loss, but there are some **simple things** you can do to reduce the risk of damaging your hearing. These include:

- Not having your television, radio or music on too loud.
- Use headphones that block out more outside noise instead of turning up the volume.
- Wearing ear protection (such as ear defenders) if you work in a noisy environment, such as a garage workshop or a building site. Special vented earplugs that allow some noise are also available for musicians.
- Using ear protection at loud concerts and other events where there are high noise levels.
- Not inserting objects into your or your children's ears includes fingers, cotton buds, cotton wool, and tissues.
- Having regular hearing tests if you work in a noisy environment. If you've lost some hearing, you can take steps to prevent further loss.

Social Care and Support Guide

If you need help with day-to-day living because of illness or disability or care for someone regularly because they're ill, elderly or disabled – including family members, the NHS **guide to care and support** explains your options and where you can get help.

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The Four Levels of Hearing Loss

Credit: Found in a Blog at <https://www.listen-2-life.com/blog/the-four-levels-of-hearing-loss-where-do-you-fit/>

Mild Hearing Loss

The quietest sounds people with mild hearing loss can hear are between 25 and 40 dB. This means soft sounds such as a ticking clock or dripping tap cannot be heard. Although they can follow a one-on-one conversation, it can be challenging to catch every word in noisy environments. Fortunately, mild hearing loss can be rectified by using a hearing aid, which amplifies the low sounds and makes it easier to hear.

Moderate Hearing Loss

On average, someone with moderate hearing loss cannot hear sounds less than 40-75 dB. People with moderate hearing loss may have difficulty understanding normal speech. They may be unable to hear the ringing of a doorbell or a telephone. Also, it can be hard to follow or hear sounds during normal everyday conversations. Depending on an individual's hearing health, a moderate hearing loss can also be improved by using a hearing aid or middle ear implants.

Severe Hearing Loss

A person with severe hearing loss can have difficulty following a conversation without wearing a hearing aid. It is almost impossible for them to understand normal speech if they are not wearing a hearing aid. Although a hearing aid can be helpful, in most cases, they are not that efficient in improving the ability of hearing. One of the treatments that can effectively rectify severe hearing loss is middle ear implants, if appropriate, or cochlear implants.

Profound Hearing Loss

This is the most significant and severe level of hearing loss. People suffering from this degree of hearing loss cannot hear sounds softer than 90-120 dB. For those who have profound hearing loss, using a hearing aid is most often ineffective. Profound hearing loss makes it difficult even to hear loud sounds, such as aeroplane engines or fire alarms. People with this degree of hearing loss cannot hear at all and usually rely on lip-reading, gestures or other visual cues. Some people will decide to use sign language. One of the best solutions to profound hearing loss is a cochlear implant, which can help an individual hear and understand speech after surgery and rehabilitation.

Rinne and Weber tests

Excerpted from: <https://www.healthline.com/health/rinne-and-weber-tests>

Rinne and Weber tests are exams that test for **hearing loss**. They help determine whether you may have *conductive* or *sensorineural* hearing loss. This determination allows a doctor to come up with a treatment plan for your hearing changes.

A Rinne test evaluates hearing loss by comparing air conduction to bone conduction. Air conduction hearing occurs through the air near the ear, and it involves the ear canal and eardrum. Bone conduction hearing occurs through vibrations picked up by the ear's specialised nervous system.

A Weber test is another way to evaluate conductive and sensorineural hearing losses.

Conductive hearing loss occurs when sound waves cannot pass through the middle ear to the inner ear. This can be caused by problems in the ear canal, eardrum, or middle ear, such as:

- an infection
- a **build-up of earwax**
- a punctured eardrum
- **fluid in the middle ear**
- damage to the small bones within the middle ear

Sensorineural hearing loss occurs when there's damage to any part of the specialised nervous system of the ear. This includes the auditory nerve, hair cells in the inner ear, and other parts of the cochlea. Ongoing exposure to loud noises and ageing are common reasons for this type of hearing loss.

Doctors use both Rinne and Weber tests to evaluate your hearing. Early identification of a problem allows you to get early treatment, which in some cases can prevent total hearing loss.

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Doctors benefit from using Rinne and Weber tests because they are simple, can be done in the surgery, and are easy to perform. They're often the first of several tests used to determine the cause of hearing change or loss. The tests can help identify the conditions that cause hearing loss. Examples of conditions that cause abnormal Rinne or Weber tests include:

- eardrum perforation
- wax in the ear canal
- ear infection
- middle ear fluid
- otosclerosis (the inability of the small bones within the middle ear to move properly)
- nerve injury to the ears

The Rinne Test	The Weber Test
The doctor strikes a tuning fork and places it on the mastoid bone behind one ear. When you can no longer hear the sound, you signal to the doctor.	The doctor strikes a tuning fork and places it on the middle of your head.
Then, the doctor moves the tuning fork next to your ear canal.	You note where the sound is best heard: the left ear, the right ear, or both equally.
When you can no longer hear that sound, you once again signal the doctor. The doctor records the length of time you hear each sound.	If you have sensorineural hearing loss, air conduction is heard longer than bone conduction but may not be twice as long.
Results	Results
Normal hearing will show an air conduction time that is twice as long as the bone conduction time.	Normal hearing will produce equal sound in both ears.
In other words, you will hear the sound next to your ear twice as long as you will hear the sound behind your ear.	Conductive loss will cause the sound to be heard best in the 'abnormal' ear.
If you have conductive hearing loss, the bone conduction is heard longer than the air conduction sound.	Sensorineural loss will cause the sound to be heard best in the normal ear.

Age-related Hearing Loss

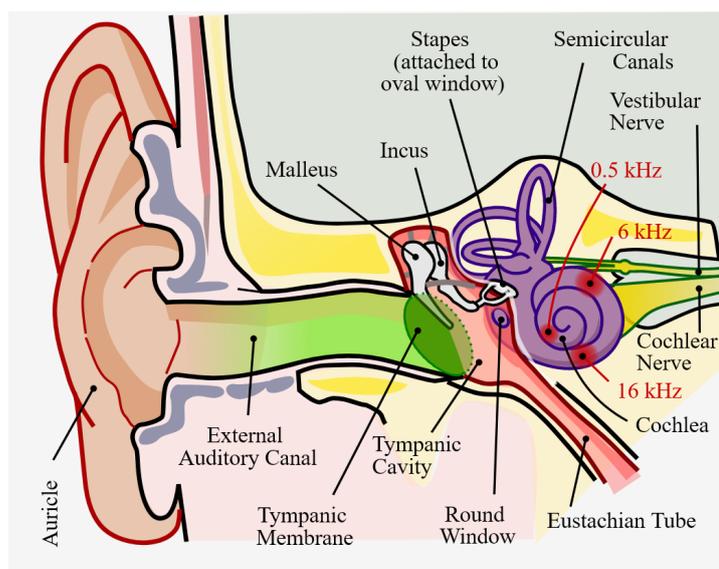
Acknowledgement to information from Mayo Clinic, [HERE](#)

Hearing loss that occurs gradually as you age (presbycusis) is commonplace and is defined as one of three types:

- Conductive (involves outer or middle ear)
- Sensorineural (involves inner ear)
- Mixed (combination of the two)

Ageing and chronic exposure to loud noises both contribute to hearing loss. Other factors, such as excessive earwax, can temporarily reduce how well your ears conduct sounds.

How sounds are heard



The vibration of the eardrum triggers a chain of vibrations through the bones. Because of differences in the size, shape and position of the three bones, the force of the vibration increases by the time it reaches the inner ear. This increase in force is necessary to transfer the sound wave's energy to the fluid of the inner ear.

Your ear consists of three major areas: the outer ear, middle ear and inner ear. Sound waves pass through the outer ear and cause vibrations at the eardrum. The eardrum and three small bones of the middle ear amplify the vibrations as they travel to the inner ear. There, the vibrations pass through fluid in a snail-shaped structure in the inner ear (cochlea). Attached to nerve cells in the cochlea are thousands of tiny hairs that help translate sound vibrations into electrical signals transmitted to the brain. It is the brain that turns these signals into sound. You can see how it works in a video [HERE](#).

Picture Credit: "File:Anatomy of Human Ear with Cochlear Frequency Mapping.svg" by Inductiveload is licensed under CC BY-SA 2.5

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Why Causes Hearing Loss?

Factors that may damage or lead to loss of the hairs and nerve cells in your inner ear include:

- **Ageing.** Degeneration of inner ear structures occurs over time.
- **Loud noise.** Exposure to loud sounds can damage the cells of your inner ear. Damage can occur with long-term exposure to loud noises or a short blast of noise, such as a gunshot.
- **Heredity.** Your genetic makeup may make you more susceptible to ear damage from sound or deterioration from ageing.
- **Occupational noises.** Jobs where loud noise is a regular part of the working environment, such as farming, construction or factory work, can lead to damage inside your ear.
- **Recreational noises.** Exposure to explosive noises, such as firearms and jet engines can cause immediate, permanent hearing loss. Other recreational activities with dangerously high noise levels include snowmobiling, motorcycling, carpentry or listening to loud music.
- **Some medications.** Drugs such as the antibiotic gentamicin, sildenafil (Viagra) and certain chemotherapy drugs can damage the inner ear. Temporary effects on your hearing — ringing in the ear (tinnitus) or hearing loss — can occur if you take very high doses of aspirin, other pain relievers, antimalarial drugs or loop diuretics.
- **Some illnesses.** Diseases or illnesses that result in high fever, such as meningitis, may damage the cochlea.

Hearing Aids

Sources: Blog at RegainHearing, [HERE](#) and <https://www.nhs.uk/live-well/healthy-body/hearing-aids/> and <https://www.ageuk.org.uk/bp-assets/globalassets/waltham-forest/documents/advice-guides/hearing-loss-advice.pdf>

Introduction

Hearing aids are powerful tools for hearing loss treatment, but very few people who need them use them. Hearing aids are not just for deaf people or those with acute or severe hearing loss, although they are very effective for this group. Hearing aids can improve the quality of life for those with even a mild hearing loss diagnosis.

There's a stigma around hearing aids about relating to people who are senile and decrepit. Hearing loss is a problem seen in significantly higher proportions of older people than younger generations and is just a natural part of ageing - **70% of people** over 70 years old have hearing loss.

But hearing loss is prevalent across all age groups. **15% of young people** between the age of 6 and 19 have some form of diagnosable hearing loss. This hearing loss can be supported by hearing aids, but this age group is much less likely to get help because of their perception of hearing aids and who they are designed for. The fact is that hearing aids are the most effective form of hearing loss treatment, no matter what age you are.

It's also important to note that hearing aids aren't the bulky devices they used to be. Hearing aid technology has come a long way in recent years. In many cases, hearing aids are now very subtle and often unnoticeable. Invisible hearing aids even exist, fitted inside the ear and invisible during everyday social interaction. If you're conscious of having an obvious hearing aid, don't let it stop you from getting the treatment you need.

Hearing aids will not make your hearing perfect, but they make sounds louder and clearer, reducing the impact **hearing loss** has on your life. Hearing aids can:

- help you hear everyday sounds such as the doorbell and phone
- improve your ability to hear speech
- allow you to enjoy listening to music and the TV at a volume that's comfortable for those around you
- make you feel more confident when talking to people and make it easier for you to follow conversations in different environments

But hearing aids only help if you still have some hearing left, so do not put off getting help if your hearing is getting worse.

How do Hearing Aids work

Source: <https://www.ageuk.org.uk/bp-assets/globalassets/waltham-forest/documents/advice-guides/hearing-loss-advice.pdf>

A hearing aid makes sounds louder so that you can hear them. It is battery-operated and you usually put it in or around your ear. Hearing aids are available in different shapes, sizes and types. However, all hearing aids work in a similar way. Very simply, they all have a built-in microphone that picks up sound. This sound is then processed electronically, either by analogue circuits, or digitally. The resulting 'signals' are then passed to a receiver, or earphone, in the hearing aid where they are converted back into sounds for you to hear. A hearing aid also has an ear mould - the part that goes in your ear - tubing and batteries.

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Hearing Aids - what options are available?

Source: <https://www.nhs.uk/live-well/healthy-body/hearing-aids/>

Some types of hearing aids may be available to use straight away. Others may need to be custom-made after your ear has been measured or a cast of your ear has been taken. Such aids will usually be ready in a few weeks. When your hearing aid is ready, it will be programmed to suit your level of hearing loss. You'll be shown how to use it and how to look after it. Another appointment will be arranged for a few weeks later to check how things are going.

With advances in technology, several different types of hearing aids are now available:

- **Behind the ear hearing aids:** The most common type is behind the ear (BTE) hearing aids. They're made up of a small plastic device that sits behind your ear. This is attached with a tube to a piece of plastic that fits in your ear (an earmould) or a soft tip that goes into the opening of your ear (an open fitting). BTE hearing aids are one of the easiest types to use and are suitable for most people with hearing loss. They're available in a range of colours.
- **Receiver in the ear hearing aids:** Receiver in the ear (RITE) hearing aids are similar to BTE hearing aids. The main difference is that with RITE hearing aids, the part of the hearing aid that sits behind the ear is smaller and is connected by a thin wire to a speaker placed inside the ear's opening. RITE hearing aids are less visible than BTE hearing aids and are suitable for most people with hearing loss, but they can be more fiddly to use than BTE hearing aids.
- **In the ear hearing aids:** In the ear (ITE), hearing aids fill the area just outside the opening of your ear. They cannot be seen from behind, unlike BTE or RITE hearing aids, but they are visible from the side. ITE hearing aids are suitable for most people with hearing loss, although they can be trickier to use than BTE or RITE hearing aids.
- **In the canal hearing aids:** In the canal (ITC) hearing aids are similar to ITE aids, but are smaller and just fill the opening of the ear. They're less visible than many other types of hearing aid, but can be trickier to use and are not usually powerful enough for people with severe hearing loss.
- **Completely in the canal and invisible in the canal hearing aids:** Completely in the canal (CIC) and invisible in the canal (IIC) hearing aids are the smallest types available. They fit further into the opening of your ear than ITC hearing aids and are barely visible. But these hearing aids are not usually powerful enough for people with severe hearing loss. They're also quite fiddly, and some can only be put in and taken out by a hearing aid specialist.
- **CROS/BICROS hearing aids:** CROS and BICROS hearing aids can help if you've lost hearing in one ear. They come as a pair. The hearing aid in the ear with hearing loss picks up sound and sends it to a hearing aid in your good ear. This can be done wirelessly or through a wire around the back of your neck.
- **Body-worn hearing aids:** Body-worn hearing aids are made up of a small box connected to earphones. The box can be clipped to your clothes or put inside a pocket. This type of hearing aid may be best if you have severe hearing loss and need a powerful hearing aid or if you find the controls on smaller hearing aids tricky to use.
- **NHS hearing aids:** Hearing aids are available on the NHS. Your GP can refer you to an NHS hearing aid provider if they think you might need a hearing aid. The benefits of getting a hearing aid on the NHS include:
 - ✓ hearing aids are provided for free as a long-term loan
 - ✓ batteries and repairs are free (there may be a charge if you lose or break your hearing aid and it needs to be replaced)
 - ✓ you do not have to pay for any follow-up appointments or aftercareBut while several modern hearing aids are available on the NHS, these are usually the BTE or, very occasionally, the RITE type. You may need to pay for private treatment if you want one of the other types. The waiting time for getting a hearing aid on the NHS can sometimes be longer than waiting for private treatment.
- **Disposable hearing aids:** These are only suitable for people with mild to moderate hearing loss. They can be thrown away and replaced with a new one when the battery runs out, usually five after ten weeks. You can buy them from some branches of Boots, the high street chemist. They cost from £26 a month for one aid.
- **Waterproof and water-resistant hearing aids:** These have a thin membrane to help stop water from getting into them. Waterproof aids are suitable for swimming, and water-resistant aids can be used for other watersports.

Digital hearing aids look just like modern analogue hearing aids, but they are different because they process sound digitally using a tiny computer inside the aid. This makes it possible to process and customise sounds very precisely to suit your hearing loss, and you can then listen to sound comfortably, whatever the pattern of your hearing loss. Many digital aids can be programmed with different settings for different sound environments that you can select at the touch of a button. Some adjust automatically, and some can be controlled via Bluetooth to an iPhone or other smartphone. Not all hearing aids are suitable for everyone, but the hearing specialist (*audiologist*) will tell you which hearing aids are suitable within your budget.

An *otologist* is a highly trained physician or surgeon who has special training in diagnosing and treating illnesses and injuries related to the ears. For instance, otologists receive more in-depth education on the physical aspects of the ear and how it works. Not all otologists perform surgery on ears, but most do. They are likely to be members of the **British Society of Otology (BSO)** and often work closely with audiologists (who are not physicians or surgeons) to treat certain ear conditions.

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If you choose to pay for private treatment:

- Make sure you research typical costs of hearing aids and any aftercare – you can pay anything from £500 to £3,500 or more for a single hearing aid.
- Shop around to see what types of hearing aids are available from different providers.
- Consider the cost of batteries, domes and other consumables and check if it's easy to change them.

Adjusting to hearing aids can be difficult at first. It may take a few weeks or months to get used to them. You'll have follow-up appointments after they're fitted to check how things are going but get in touch with your audiologist at any point if you're having problems.

Hearing Aid Comparison Chart							
	Invisible Products	Receiver-In-Canal	Completely-In-Canal	Behind-The-Ear	In-The-Canal	In-The-Ear	Hearing Amplifiers
	(IIC)	(RIC)	(CIC)	(BTE)	(ITC)	(ITE)	(AMP)
Available Colours	Many	Many	Many	Many	Many	Many	Black
Wireless Connectivity	✓	✓	✓	✓	✓	✓	✓
Rechargeable Solutions		✓					
Tinnitus Solutions	✓	✓	✓	✓	✓	✓	✓
Single-Sided Hearing		✓		✓			
Degree of Hearing Loss	Mild to Moderately Severe	Mild to Severe	Mild to Moderate	Moderate to Severe	Mild to Mildly Severe	Mild to Severe	Mild
Battery Size	10	312 or 13	10 or 312	312 or 13	312	312 or 13	10

ATtribution: Adapted from: <https://www.hearingisbelieving.com/hearing-aid-comparison-chart/>

Hearing Aid Timeline

Hearing loss is not a new condition. It's been around for aeons. Until the 16th century, people with hearing loss often suffered from multiple other disabilities and, as a result, were heavily discriminated against. Pedro Ponce de León, a Spanish Benedictine monk, is believed to have been the first person to develop a method for teaching the deaf.

Boots Hearingcare say that the earliest records of hearing aid usage date back to the 13th century. In the 17th century, the ear trumpet was invented and is considered the first device used to help the hearing impaired. Trumpets were made of everything from sheet iron to animal horns. By the late 18th century, their use was becoming increasingly common.

Picture Credit: "A woman shouting into a man's ear-trumpet. Wood engraving." is licensed under CC BY 4.0



Fast forward to the 19th century: the first hearing aid emerged due to Alexander Graham Bell's 1876 invention of the telephone, which made technology available to control loudness, frequency, and distortion of sounds.

The 20th century saw the first commercially manufactured hearing aids (1913), vacuum-tube aids (1920), and the appearance of the first all-digital hearing aids in the 1990s. Not long afterwards, Bluetooth technology (2010) was added to the mix, taking the efficacy of hearing aids to a new level.

Early devices, such as ear trumpets or ear horns in the 17th century, were passive amplification cones designed to gather sound energy and direct it into the ear canal. Modern devices are computerised electroacoustic systems that transform environmental sound to make it 'hearable' to the wearer. Today, virtually all commercial hearing aids are fully digital, and their digital signal processing capability has significantly increased. Small and low-power specialised digital hearing aid chips are now used in all hearing aids manufactured worldwide. Many additional new features also have been added with various on-board advanced wireless technology.

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"Made for iPhone hearing aids" (MFi) enables users of MFi digital hearing aids to stream phone calls, music, and podcasts directly from iOS devices using Bluetooth.

You can read a comprehensive timeline on the history of hearing aids on the websites of [HearingHealthCentre](#), and [The Washington University School of Medicine](#).

Help and Information

Several hearing loss organisations can provide help and support if you're adapting to hearing loss or considering life with a hearing aid:

- RNID has information about [local support services](#)
- [HearingLink](#)
- [National Deaf Children's Society \(NDCS\)](#)
- [AbilityNet](#)
- [Age UK](#) (Age UK brings together Age Concern and Help the Aged)
- [Association of Teachers of Lipreading to Adults \(ATLA\)](#)
- [British Academy of Audiology \(BAA\)](#)
- [BID Services](#) (a charity working with children and adults with hearing loss, sight loss or both)
- [Deaf and Equal](#)
- [DeafBlind UK](#)
- [Hearing Dogs for Deaf People](#)
- [Hearing Loss and Deafness Alliance](#)
- [Jewish Deaf Association \(JDA\)](#)
- [Lipreading Skills](#)
- [National Association of Deafened People \(NADP\)](#)
- [The National Institute for Health Research \(NIHR\)](#)
- [Open Ears](#) (a non-denominational Christian charity for people who have various degrees of impaired hearing)
- [Royal Association for Deaf People \(RAD\)](#)
- [Royal National Institute for Deaf People \(RNID\)](#)
- [Sense](#) (a national charity that supports and campaigns for adults and children who are deafblind)
- [Soundz Off](#) (a list of organisations for people in the UK who are hard of hearing or deaf)
- [UK Council on Deafness](#) (UKCoD is the umbrella body for voluntary organisations working with deaf people in the UK)
- [UK Hearing Conservation Association](#)

Advice on commercial hearing aids is available through your local NHS audiology clinic.

Which?, the consumer advisory and product comparison organisation, has surveyed more than 1,500 customers to provide an essential guide to the best and worst hearing-aid providers. You can read about it [HERE](#). The *Which?* magazine is a membership subscription service. If you're not already a member, you will need to join *Which?* to get instant access to this and their guide to hearing-aid prices.

The *Action on Hearing Loss* website has information about an online hearing test [HERE](#).

AgeUK has a helpful publication on hearing loss which is available online [HERE](#).

Facts and Figures

The Royal National Institute for Deaf People (RNID) has a webpage devoted to the latest facts and figures on hearing loss and tinnitus. You can access it [HERE](#). Several startling facts stand out:

- Hearing loss can increase the risk of dementia by up to five times, but evidence also suggests that hearing aids may reduce these risks.
- Evidence suggests that people wait on average ten years before seeking help for their hearing loss and that when they do, GPs fail to refer 30–45% to NHS audiology services.
- More than 40% of people over 50 years old have hearing loss in the UK, rising to more than 70% of people over 70 years old.
- An estimated 1.2 million people in the UK have hearing loss greater than 65 dBHL.
- By 2035, it is estimated there will be around 14.2 million adults with hearing loss greater than 25 dBHL across the UK.
- There are 7.1 million adults in the UK living with tinnitus.

People with Diabetes

Source: Report on HealthyHearing, [HERE](#).

If you have diabetes, you likely know that complications from it can include kidney and heart problems. But did you know it can also affect your hearing and sense of balance?

If this is news to you, you aren't alone: many people aren't aware of the hearing and balance risks of diabetes, [experts say](#), including health professionals. For this reason, an organisation in the USA called [The Audiology Project](#) has been working with major health groups to raise awareness. Their efforts are paying off: The *US Centers for Disease Control (CDC)* and the *American Diabetes Association* recently added educational pages on the links between ear health, balance and diabetes.

Information about Hearing Loss

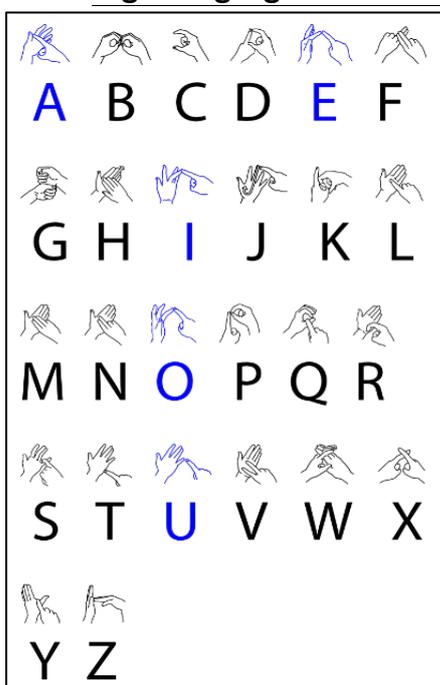
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For patients, both diabetes and hearing loss can be difficult to self-detect. Many people do not realise they have hearing loss, so it may be a surprise to know hearing could be affected when they have diabetes.

CDC now recommends that people get their hearing tested every year if they have diabetes. It is not certain that the same is being recommended in the UK, but it certainly makes sense. According to CDC, high blood glucose levels from untreated diabetes can weaken the blood vessels in the ear and the nerve cells in the inner ear (known as the "hair cells"). Like other parts of the body, these hair cells rely on **good circulation**. Once they are damaged or die, hearing is permanently affected.

People with diabetes are more than twice as likely to have mild to moderate **high-frequency hearing loss** than those without the disease, a landmark **study** by the US National Institutes of Health (NIH) revealed. Although **not as studied** as the link between diabetes and hearing loss, *tinnitus* (ringing in the ears) seems more common among people with diabetes. Diabetes medications may play a role, too, as many **drugs are known to cause hearing loss or tinnitus**.

Sign Language



Picture Credit: "File:British Sign Language chart.png" by User:CowplopMorrisTalkContribs at en.wikipedia. is licensed under CC BY-SA 3.0

Sign languages are a means of communication using visual gestures and signs to convey meaning in place of sound. They are expressed through manual articulations in combination with non-manual elements. Sign languages are full-fledged natural languages with their own grammar and lexicon. The picture (left) shows the British Sign Language. There are many types of sign language in use worldwide, and most are just as different from each other as their spoken counterparts. Yet all have a common element: no sound. As such, the languages are used in communication with deaf or partially deaf people.

The Deaf Health Charity, **SignHealth**, says that most deaf people who use sign language in the UK use British Sign Language (BSL) with its rich combination of hand gestures, facial expressions, and body language. Like English, it has its own grammar, syntax and lexicons. You can download pictures of the basic signs in BSL from **HERE**, but examples are shown above, right. The government recognised British Sign Language (BSL) as a language in its own right in March 2003. The **BDA** (British Deaf Association) suggests that BSL is the first or preferred language of over 87,000 deaf people in the UK. It has its own grammar and principles, which are completely different from the grammatical structure of English.

While subtitles and closed captions are becoming increasingly available to assist anybody with a hearing impairment when viewing a screen, sign language remains a hugely popular method of communication among the deaf community. Sign language resources that are available today include:

- Anybody in regular contact with a member of the deaf community in the UK should possess a copy of **The British Sign Language Dictionary**.
- **The Institute of British Sign Language** (IBSL) is a leading UK awarding organisation providing British Sign Language (BSL) and other qualifications linked to deafness.
- **Deafsign** is a one-stop location for all matters relating to sign language and communication with the hearing impaired.
- **Signature** offers support to the hearing impaired, including qualifications in sign language.
- The **fingerspelling alphabet** is a must if you regularly interact with deaf people.



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Lip Reading

For those who can't hear everything said, joining a friendly lip-reading class can provide skills to help communicate and pick up tips from people in a similar position. Lipreading classes are designed to give confidence and skills to help communicate better. The classes are taught by a qualified teacher. They are informal, and you can go at your own pace. The teacher will demonstrate the different shapes that sounds make on the lips to identify them. They will also explain how to fill in the gaps of speech that you can't hear and how to use clues from the context of the conversation. If you cannot go to a class, you can practice lip-reading at home, thanks to the website [lip-reading practice](#).

More Information

- For more information about lip-reading, see the RNID leaflet [Learning to Lipread](#).
- To find out if there's a lip-reading class in your area, contact the RNID [Information Line](#) or the [Association of Teachers of Lipreading to Adults](#).

Hearing Dogs



Picture Credit: "Hearing Dog for Deaf People" by Leo Reynolds is licensed under [CC BY-NC-SA 2.0](#)

Most people know that those living with visual impairment can enjoy the company and assistance of a guide dog, but few are aware that people with hearing difficulties can seek the help of a hearing dog. Dogs have a sense of hearing that is up to twice as strong as an adult, making hearing dogs hugely beneficial to anybody struggling with deafness or any other form of hearing impairment. In 1992, the [Princess Royal](#) became Royal Patron, both for Hearing Dogs and Hearing Link.

[Hearing Dogs for Deaf People](#) has been training support animals to assist the hearing impaired for over 35 years – even if you do not require their services for yourself, you can always sponsor a puppy to help somebody who does ([HERE](#)). Further information about hearing dogs can be found [HERE](#).

A big part of a hearing dog's job is to alert their deaf recipient to sounds they would otherwise miss. Simple sounds we take for granted like the doorbell, alarm clock and even danger signals like the fire alarm.

Thanks to a hearing dog, being aware of these makes a real difference in deaf people's lives. You can watch a video to see some of the sounds our hearing dogs alert to, [HERE](#).

Action Plan

It is estimated that around 5% of the world's population, [466 million people worldwide](#), live with some degree of hearing impairment. Even if hearing loss has not yet touched your life, it's a safe assumption that it will do so sooner or later. If you have a hearing problem but so far have done nothing about it, maybe you should consider the following:

- Get a hearing check by Action on Hearing Loss online or by calling [0844 800 3838](#) (charged at a local rate). They can also give you advice, information and details about local support.
- Talk to your GP about a hearing assessment if your hearing loss is causing problems.

Those with a hearing problem may be entitled to some benefits - [Age UK's Benefits Calculator](#) can help you determine what benefits you could be owed. It's free to use, and the details you provide are kept anonymous.

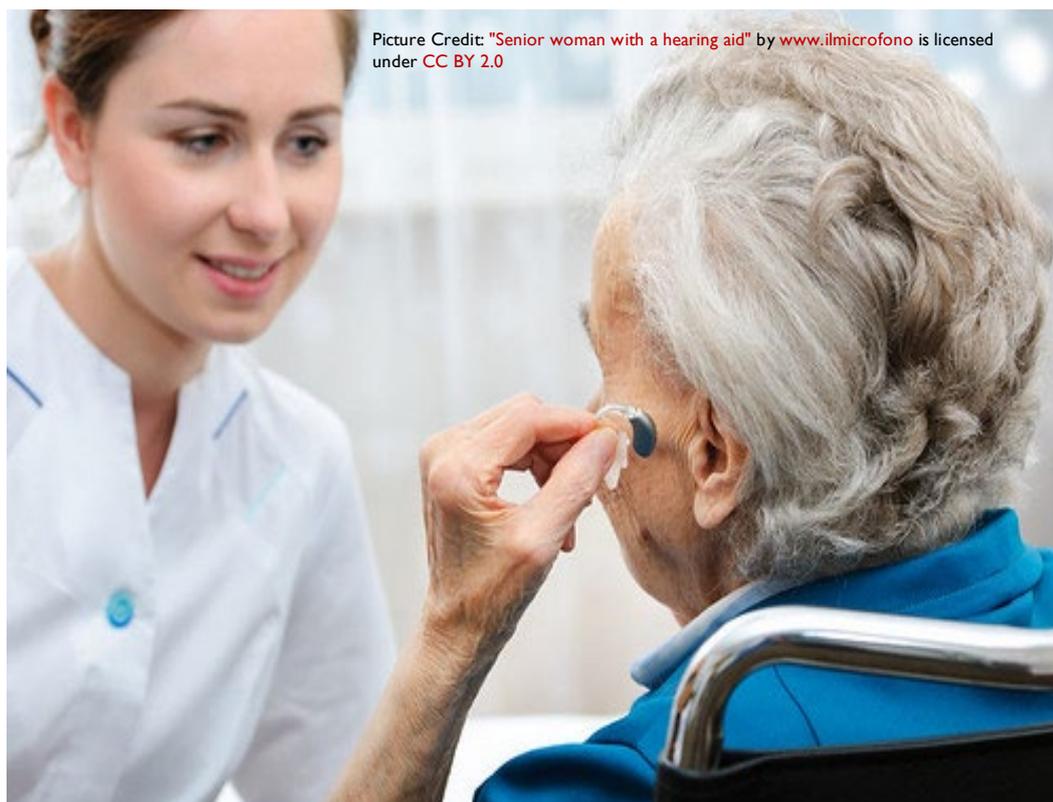


Information about Hearing Loss

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Sources and recommended reading for further information

- <https://www.hearinglink.org/your-hearing/about-hearing/why-do-we-need-to-hear/>
- <https://www.nhs.uk/conditions/hearing-loss/>
- <https://blog.medel.pro/bone-conduction-candidacy-audiogram/>
- <https://www.mayoclinic.org/diseases-conditions/hearing-loss/symptoms-causes/syc-20373072>
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- <https://www.ageuk.org.uk/information-advice/health-wellbeing/conditions-illnesses/hearing-loss/>
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- <https://www.hopkinsmedicine.org/health/conditions-and-diseases/hearing-loss/types-of-hearing-loss>
- <https://www.signature.org.uk/british-sign-language-qualifications/https://hearingsystemsinc.com/the-history-of-hearing-aids/>
- https://en.m.wikipedia.org/wiki/Hearing_aid
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- <http://beckerexhibits.wustl.edu/did/timeline/>
- <https://www.ageuk.org.uk/wp-assets/globalassets/waltham-forest/documents/advice-guides/hearing-loss-advice.pdf>
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- <https://www.nia.nih.gov/health/hearing-loss-common-problem-older-adults>
- <https://rnid.org.uk/about-us/research-and-policy/facts-and-figures/>
- <https://www.healthyhearing.com/report/53264-Hearing-loss-diabetes-tinnitus>
- <https://www.nhs.uk/conditions/hearing-loss/symptoms/>
- <https://rnid.org.uk/information-and-support/hearing-loss/signs-of-hearing-loss/>
- <https://www.amplifon.com/uk/recognising-hearing-loss/signs-and-symptoms>
- <https://www.which.co.uk/reviews/hearing-aid-providers/article/best-hearing-aid-providers/best-hearing-aid-providers-overview-a0bwU2e7Kzyu>
- <https://rnid.org.uk/information-and-support/hearing-loss/living-with-hearing-loss/lipreading/>
- <https://householdquotes.co.uk/living-with-hearing-loss/>
- <https://web.archive.org/web/20150605052630/http://www.who.int/mediacentre/factsheets/fs300/en/>



Picture Credit: "Senior woman with a hearing aid" by www.ilmicrofono is licensed under CC BY 2.0

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