

The Ear how we hear

How we hear?

What makes us hear?

**Then how do we communicate
It's your brain that hears NOT your ears!**

The different parts of the Ear capture sound waves and Funnel these through to the acoustic nerve in our brain. Which then translates the sound into meaning.

The Outer Ear

The outside ear captures sound. Vibrations then travel along the ear canal to the **ear drum.** **It's quite a short canal, in size.** This Canal is as long as your **little finger nail.** Poking your ear with your nail or a baby bud can damage your **eardrum. Once damaged you will lose your hearing.**

The Middle Ear

As the sound travel through the ear canal, The Ear drum vibrates and starts three of the tiniest little bones in your body. These are in the Middle ear These bones are called the oscicles. The Hammer, the Anvil and the stirrup. The higher the sound frequencies the faster these oscillate.

Moving from the Middle Ear

The Eustachian tube is where fluid and air can flow. If you have a cold the Eustachian tube can also get blocked with fluid. It makes the Oscicles move slower and hearing sometimes feels blocked.

The Oscicles job is to stimulate the Inner Ear onto a fluid filled pouch called the cochlear.

The cochlear is a spiral coil

This looks similar to the coils on a snail's shell. This spiral pouch is full of fluid with small nerve like hairs swaying backwards and forwards allowing the sound waves to be passed to the acoustic nerves; These fibres become damaged by loud sounds, many performers in the music, theatre and entertainment industry suffer with hearing loss. Especially singers who have performed with a band, Also Infection, those who suffered a very bad ear infection during childhood. Strong medication also such as chemotherapy in some instances. Once the Nerve Hairs die Hearing loss takes place.

They die and never grow again. They're like several little combs standing up ready to receive sound waves. As the fibres react, they press the little comb like hairs together and create electrodes flowing into the nerves and to the brain. Rather like fingers or seaweed waving in harmony to sounds.

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The Auditory cortex of the brain.

This is where sound is translated in the brain. The auditory cortex has developed and evolved over millions of years. This belongs to the largest region of the cerebrum; The mammalian brain. It plays a key role in **memory, attention, perception, cognition, awareness, thought, language, and consciousness developed 20 million years later**

The outside cochlear coil dictates a Higher sound and it is why the higher frequencies become more damaged and less can be heard. Higher frequencies are sounds such as leaves rustling and birds singing. The centre of the coil are lower sounds.

It's interesting that a Barn Owl's cochlear nerve hairs re-grow if damaged. Their ears do not run parallel to their eyes, one ear is higher than the other. The older the Owl becomes the more cochlear nerve hairs it can reproduce. In captivity it can live as long as 30 years.

Attached at the top of the cochlear are three fluid filled circles. These circular rings **operate balance.** When we move our head from side to side and up and down. The brain turns these signals into our balance.

Hearing aids will only amplify they do not as yet block out background noise satisfactorily and thus allow the brain to sort out speech signals from background noise. NHS hearing aids are set automatically on installation: **There are 4 settings speech, background noise, music, and the T Loop,** which you see at most reception desks. But not all staff at reception desks have been taught that they should speak into a microphone. Or even turn it on.

There's no need to hide a hearing aid.

There seems to be a **stigma** about wearing one. Looking for the smallest one possible to cover up your hearing loss. Perhaps it goes back to the days when people would say "Oh they're deaf and dumb" Or does it show age?

Remember: If you do suffer from hearing loss. You are not alone; Hearing impairment affects 1 in 4 and it's becoming more common. Most of it now is noise induced whereas in the past it could have been an abscess in the ear.

Feel proud of yourself, if you've sought help and wear a hearing aid you've done something about your hearing loss!

There is a new private hearing aid on the market called the **opn.oticon** hearing aid. It can pick out **speech and directional speech** and also cut out background noise completely. It's said to be the Rolls Royce of hearing aids. Private and very expensive.

Sometimes, depending on the hearing loss and why it has happened, they fit an aid called a **BAHA.** Bone anchored hearing accessory. This bone runs along the skull above the ear. There is another type of aid this is a **cochlear implant.**

Scientists are experimenting on hearing sound better. They're researching with a captured **Minke whale** called Oris. He can reproduce some sounds. Such as "Hello" and repeat the count up to three. They knew fish could sense sound. The other experiment is the thread of spider's webs these pick up the slightest of vibrations.

New materials are being discovered becoming smaller and more flexible.

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