Hearing Impairments

There are many ways that a human's hearing can be impaired. This article will focus on two main types that cover most of what we experience in terms of hearing loss.

Conductive Hearing Loss

This is an inability to **conduct** (pass along) sound waves from the outer ear through the ear drum to the middle ear. **Conductive** hearing loss can be **temporary** or **permanent** and ranges in its severity from mild to complete deafness. Some causes include:

- Build-up of ear wax
- Ear infection
- An object blocking the ear canal
- **Abnormal** bone growth in the middle ear
- Tumour in the ear canal or middle ear
- Burst ear drum
- Fluid build-up in the middle ear
- Narrow ear canal

All of these things prevent the sound wave vibrations from being passed from the outer ear to the middle ear, so hearing either doesn't occur or it is limited. Some of these causes have simple treatments such as removing excess wax or treating the infection but others are not so easy to fix and require complicated surgery. Some internal and external hearing aids can be used, with the most effective being bone conduction hearing aids which bypass the outer and middle ear taking sound waves straight to the cochlea.

Case Study One: Phyllis, a 37-year-old Dental Hygienist

Describe your hearing loss: I am completely deaf in my right ear. I lost my hearing overnight suddenly and it was very frightening. It has taken me many years to get used to the hearing loss.

When did the hearing loss occur? I was 25 years old.

What caused you to lose your hearing? A virus in my brain formed a blood clot. The clot eventually dissolved but the lack of oxygen in the auditory nerves meant that the nerves connecting my ears to my brain no longer functioned. My ears and brain were fine, they just didn't connect. A bit like having a computer and a mouse but no connecting wire.

What type of hearing loss do you have? Nerve damage.

Are there/have you had any treatments for the hearing loss? No.

What is the most difficult thing about having a hearing impairment? The most difficult part is twofold. Getting a sense of direction when you hear a noise. Even crossing the road is hazardous as you don't know where the cars are. Secondly, it is very difficult to hear people speaking if they are on my deaf side. I have to stare at them and watch their lips moving. Quite often I don't quite get what they are saying but am too embarrassed to ask, so I just fill in the blanks myself.

Sensorineural Hearing Loss

This is due to problems in the nerves, inner ear or brain that can result in mild hearing impairment through to total deafness. The ear conducts sound waves as normal but the electrical messages either are not made properly, do not reach the brain or they cannot be interpreted inside the brain.

Sensorineural hearing loss includes the standard age related decline that we will all experience. From the ages of 25-30 a human's hearing starts to **deteriorate** and we lose the ability to hear higher pitched sounds. This is a natural decrease usually due to the damage that higher pitched sounds do to the workings of the inner ear over time. However, excessive noise is the most common cause of this type of hearing loss and a recent medical report states that 16% of teenagers have some form of hearing loss from the constant exposure to loud music via headphones. This occurs because the tiny hairs inside the cochlea that turn the sound energy into **electrical impulses** are easily damaged and destroyed by loud noise and once they die they never grow back.

Apart from age and loud noises, there are many other causes of hearing loss, such as:

- Birth **defects**
- Brain damage
- Limited blood flow
- Drugs
- Viruses like measles
- Meningitis
- Brain tumours
- Head injuries

Hearing aids can be used to help some people with sensorineural hearing loss. These small devices can be worn inside the ear opening and **amplify** sounds at the **frequency** that the person's own hearing doesn't respond to. So, for age related deafness, the hearing aid would be set to increase the volume of higher pitched sounds.

Case Study Two: Lionel, a 68-year-old Farmer

Describe your hearing loss: I have been getting steadily worse and worse over the years. High pitched noises are almost impossible to hear (like the phone ringing and doorbell chiming) and I also find it hard to hear when there are lots of people talking at once or if there is loud music playing. My family sometimes have to tell me to stop shouting as I try to be heard. The thing is, it is actually just me that can't hear!

When did the hearing loss occur? Over the last 15 years or so but I have really started to notice it more over the last 5 years.

What caused you to lose your hearing? My job as a farmer involves working with lots of loud machinery and vehicles. The milking shed machinery is really loud and while milking I am always close to the machinery. I have been farming for 50 years so that is a lot of time spent near loud machinery. Back in my day, we never thought about wearing ear protection so would mow the lawns, use the chainsaw and drive the tractors with no ear muffs. No doubt all that noise caused some damage.

What type of hearing loss do you have? Age-related I suppose because as I am getting older, it is getting worse.

Are there/have you had any treatments for the hearing loss? To help me hear, I am supposed to wear hearing aids in both ears when I am around other people. I never used to wear them but nowadays I need them more and because they are much smaller and more effective now, I don't mind so much.

What is the most difficult thing about having a hearing impairment? I am still farming and lots of my day is spent on my own, so that doesn't matter too much. The worst part is not being always able to hear my family and not quite getting the whole conversation when with friends. My bad hearing really annoys my wife who has to shout and repeat herself when I am not wearing my hearing aids.

Many technologies can be used to treat deafness and hearing loss and the advances being made each year are **astounding** but it is still a difficult issue to fix.

If you have hearing that is in good working order then look after your ears now and reduce the amount of damage being done by loud noises through limiting your exposure to it and using ear protection when possible.

Prevention is the best method of treatment. Stop the damage before it starts!