

HEARING LOSS

A quick guide to the different types of hearing loss and the treatments available.



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Introduction

"31 Million Americans and 12 Million Brits Have Hearing Problems, You are definitely not alone."

Many people suffer from hearing loss...and we're not just talking about the people whose hearing is diminished.

Hearing loss affects friends, family, co-workers, business associates, and everyone a person with a hearing problem comes into contact with. The latest available statistics show that over 10% of the U.S. population reports difficulty hearing!

That's more than 31 million people! And as the Baby Boomer generation continues to age, that number promises to increase dramatically!

Are you someone who no longer hears as well as you once did? If so, you are certainly not alone. Consider these statistics reported by Sergei Kochkin, Ph.D., former Executive Director of the Better Hearing Institute:

- 3 in 10 people over age 60 have hearing loss
- 1 in 6 baby boomers (ages 41-59), or 14.6%, have a hearing problem
- 1 in 14 Generation Xers (ages 29-40), or 7.4%, already have hearing loss
- At least 1.4 million children (18 or younger) have hearing problems
- Estimates say 3 in 1,000 infants are born with serious to profound hearing loss

In addition, studies have linked untreated hearing loss to emotional, physical, mental, psychological and even economic disadvantages! And, to make matters even worse, there are many "myths" about hearing loss that prevent those with hearing loss from doing anything about it.

Sensorineural Hearing Loss

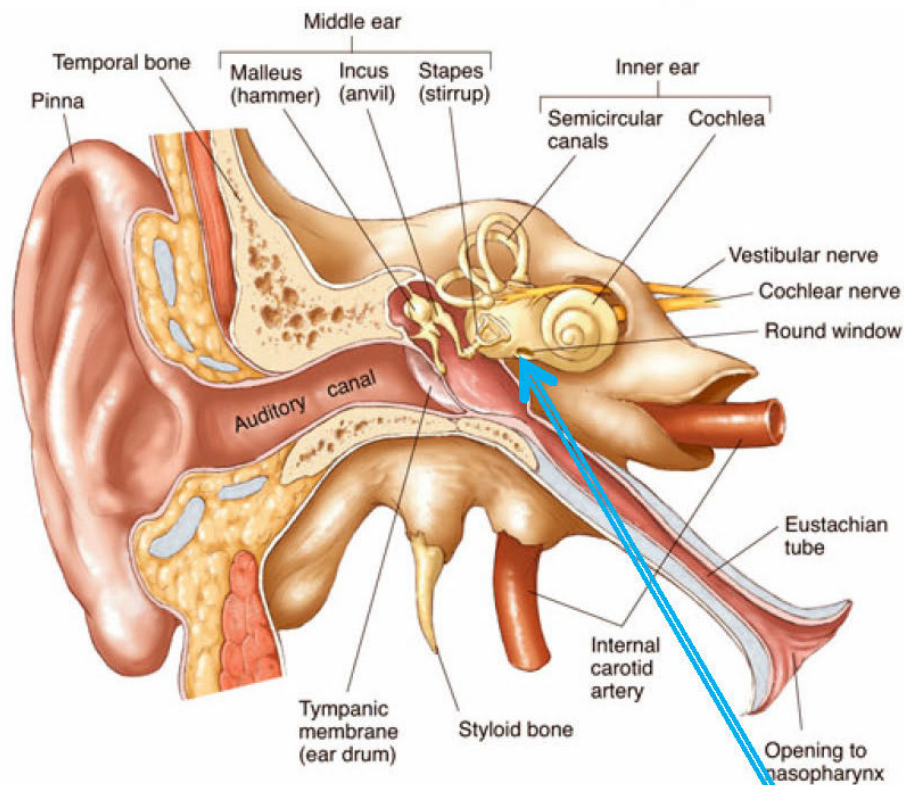
Sensorineural hearing loss occurs when the tiny hair cells in your cochlea (inner ear) that help pass sound information to the brain are injured, diseased, do not work correctly, or have died. Those hair cells are in fact nerve endings that are responsible for sending electrical stimulation to the brain. This type of hearing loss can't be reversed at this time although there are hopes that in the future there may be treatment.

Sensorineural hearing loss is commonly caused by:

- Presbycusis.
- Acoustic neuroma.
- Childhood infections, such as meningitis, mumps, scarlet fever, and measles.
- Meniere's disease.
- Regular exposure to loud noise which is called noise induced hearing loss. Noise exposure accelerates the natural deterioration of our hearing. Noise can do terrible and permanent damage.

A sensorineural hearing loss reduces the ability to hear faint sounds or discriminate speech. Even when speech is loud enough to hear, it may still be unclear or sound muffled. Speech is exceptionally difficult to hear in most cases if there are any competing sounds such as background noise.

10% of the US population have trouble hearing. That's more than 31 million people!



The problem is usually here

The only treatment for Sensorineural hearing loss is hearing aids

At present the only available treatment for this type of hearing loss is the use of hearing aids.

Hearing Loss is usually a gradual process, many factors can contribute to hearing loss such as noise in work, loud music, general environmental noise if you live in a noisy city, diet, ototoxic drugs, smoking, heart disease and stress.

Hearing loss affects around 10% of the population. In America it means there are around 31,000,000 people with a hearing problem or hearing impairment. Unfortunately, only a small number of those who need a hearing aid system actually use one, many who don't are putting themselves at many disadvantages and greatly reducing their quality of life.

The Consequences of Untreated Hearing Loss

There are many consequences of hearing loss physical, social and physiological. Hearing loss can lead to problems such as social exclusion, isolation from family and friends, depression, anger, stress, irritability, withdrawal, loneliness, embarrassment, denial, boredom, social rejection, feelings of inadequacy, misinformation, increased irritability, anxiety and fatigue.

The sad thing is that these consequences are unnecessary. The benefits from treatment of hearing loss with hearing aids have dramatically increased over the years.

Modern hearing aids are astonishing pieces of kit that deliver massive benefits. These are definitely not your Grandfather's hearing aids!

Conductive Hearing Loss

Conductive hearing loss occurs when sound is not conducted efficiently through the outer ear canal to the eardrum and the tiny bones (ossicles) of the middle ear. Conductive hearing loss usually involves a reduction in sound level or the ability to hear faint sounds.

Whereas a sensorineural hearing loss means your ear is not able to process all the sounds that travel in to your ear, a conductive loss means that the sounds are not able to travel in to their ear efficiently.

It can be caused by many factors with many of them childhood problems. Conductive hearing loss is usually something that you have been aware of since an early age, it is very rarely a sudden thing except in accidents.

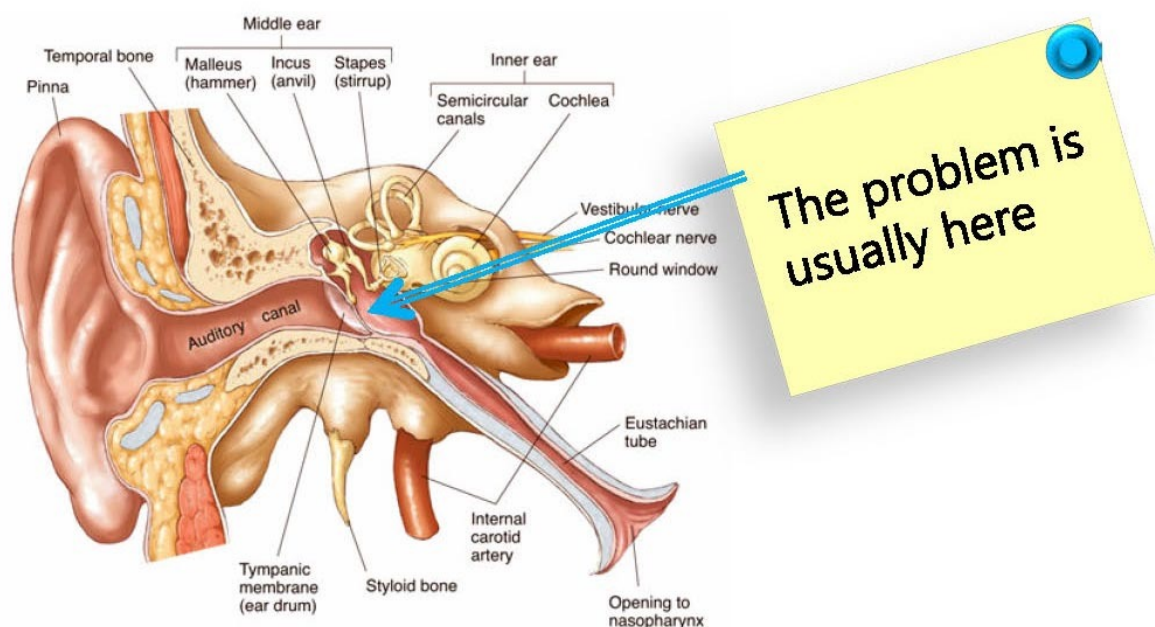
Some possible causes of conductive hearing loss are:

- Fluid in the middle ear.
- Ear infection (otitis media).
- Perforated eardrum.
- Impacted earwax.
- Infection in the ear canal.
- Swimmer's Ear.
- Presence of a foreign body.
- Absence or malformation of the outer ear, ear canal, or middle ear.

There may well be surgical treatment for a conductive hearing loss. You can always investigate your options and weigh up the pros and cons.

Any surgical treatment is something that must be carefully considered. Any

procedure that involves a general anaesthetic is one that should be approached carefully.



Hearing aids tend to work very well for conductive losses

Because of the nature of conductive hearing losses, even modern basic hearing aids tend to work very well for patients.

With conductive hearing loss all that is needed is for the hearing aids to make the sounds louder for you. Because the problem is in effect mechanical rather than processing, once you overcome the sound transmission problem there is usually excellent results.

This happens because in most conductive losses there is no damage to the cochlea, so once we can get the sound in there, it will handle it as it normally would. use one, many who don't are putting themselves at many disadvantages and greatly reducing their quality of life.

Mixed Hearing Loss

Sometimes a conductive hearing loss occurs in combination with a sensorineural hearing loss. In other words, there may be damage in the outer or middle ear and in the inner ear (cochlea) or auditory nerve. When this occurs, the hearing loss is referred to as a mixed hearing loss.

Normally the conductive loss comes first, and the sensorineural element happens with aging. Even though it is a mixed loss and quite complex, it usually will respond well to treatment with hearing aids.

Hearing aids tend to work well for mixed losses

Mixed hearing loss is quite a complex loss to treat. We need to overcome both the mechanical and processing problems. We need to overcome the middle ear problem but still address the inner ear issues.

Modern hearing aids are quite adept at dealing with these issues though. Although you may have to spend more time getting your hearing aids tweaked and re-programmed for the two different hearing losses, results are usually excellent in the end.

Hearing Aid Purchase Options

In order to privately procure a hearing aid you need to attend a provider, pretty simple really, however, you have a choice of different types of providers available to you. There are corporate type providers such as Amplifon, Boots and Specsavers in the UK and Miracle Ear, Hear USA and Beltone in the US. There are also Independent providers who may be large multi branch outlets or smaller single outlet businesses. Let's talk about them.

Corporate Providers

Corporate providers usually offer a pretty good service including on-going aftercare, although with many it can be a bit like a conveyor belt. I worked for Amplifon in Ireland back in the day and I have to say that they were on the cutting edge of best practice and service. We provided an outstanding level of service to our Patients and they still do.

However, we worked within the constraints that were set and our business was sales, don't get me wrong, it also involved real committed care, but sales were what it was all about. Most corporate providers are built on this system, there is always some pressure on staff to sell, that is simply how they survive.

There will usually be some pressure on staff to sell one product line specifically in most corporate chains. Again Amplifon were a little different, they have a wide selection of brands but the pricing of the devices tends to control what is sold. Amplifon is a corporate entity but it is in fact

independent of any manufacturer. They have arrangements with particular manufacturers and those arrangements mean that certain brands are more advantageous for them to sell. However, as long as I was there they didn't interfere at the macro level and let Dispensers sell whatever they felt best. This is an important consideration for you the buyer, let me explain.

Many corporate providers are in fact owned by hearing aid manufacturers, it simply means that they will sell you devices from that manufacturer, for instance Boots is owned by Sonova the owners of Phonak and Unitron. This type of vertical integration is just increasing within the business, more and more manufacturers are buying retail outlets.

This limits your choices, it is simple, more often than not you are getting one brand no matter what. Honestly, this doesn't necessarily mean that the device or brand won't be suitable for you, it just means there is no real choice on offer. I don't think that this is necessarily a bad thing, I just think that you should be clear on it. They really should make it clear to you, I believe an educated decision is nearly always a good one.

In essence, while corporates try to ensure that the best service and experience is on offer across their chains, it is sometimes not the case.

Independent Hearing Aid Centres

Independent providers are just that, they are independent of any hearing aid manufacturer or corporate entity. They are usually small family run businesses although some may be multi branch. More often than not though they are single branch entities that may offer their service in branch and perhaps across a few clinics situated in associated health partners such as Opticians or even Chemists/Pharmacies/Medical Centres.

Independents generally have access to all of the hearing aid manufacturers, however, in practice they will usually only use perhaps three brands at most generally. There will be a primary brand, and two secondary brands. Generally these are picked for a variety of reasons, some commercial in nature such as pricing and some clinical in nature such as efficacy and perhaps specialisation.

If I was running my own Independent practice I would probably choose Widex, Phonak and GN Resound as my three suppliers. I would choose them in particular because they would be able to provide me with pretty much everything I needed to meet the needs of my customers.

However, as different innovations came along I would be considering other brands or re-considering what share of each brand I supplied. Let me explain my thinking, Phonak is recognised as the leader in power hearing aids, so I would always consider Phonak for my power needs, however, GN Resound are the only manufacturer to supply a made for iPhone power hearing aid.

So it makes perfect sense for me to discuss these brands with someone who needs a power aid. Widex has a Power offering called the Super, but it is several years old now so I would discount it because I believe that both Phonak and Resound have superseded it with better technology. That is the freedom that being totally independent delivers, you make the best decisions based on the customer in front of you and the latest and best technology available.

What Does it Matter to You?

First of all, you want the latest and best for you and your hearing loss, it is as simple as that. Secondly, hearing aids aren't the same as glasses. You do not just put them on and everything is fine. That is a simple truth, hearing aids take time to get used to, they also take time to get the very best out of. This is usually called rehabilitation.

You might not realise it but the services of a good hearing professional is absolutely imperative for your ongoing experience. In order for you to get the best out of any hearing aids you buy, you will need a committed and skillful professional to help you.

Why do You Need Help?

As I said, hearing aids are not like glasses, firstly, by the time you choose to buy hearing aids you will probably have been suffering a hearing loss for up to seven years or more.

If I was to give you full amplification, the prescription you needed to correct your hearing, you would run screaming from my office. I do mean that, you wouldn't like it.

So, I will first set you to a reduced prescription, one that benefits you but doesn't challenge you too much. You will still note a dramatic difference, however it will be as much as you can handle. Over a period of time that really does vary from customer to customer I will then increase the amplification to your prescription level.

Think it's Over Then? Think Again

No, this isn't when the fat lady sings, generally your prescription level is just a starting point, a good starting point but just a starting point. Sound is a very personal sense, I like classical music my wife thinks it is noise. Each one of us is slightly different, unique in a way. Generally most people will need some fine tuning undertaken around their prescription to be happy with the sound of their hearing aids.

So finally, after all those appointments we have got you to a place where the sound the hearing aids produce is just right for you. That's when we start investigating the settings for different situations and discussing how you are getting on generally.

This just doesn't happen in the first week or month, this takes time and effort both on your part and the part of the professional who is helping you. That professional needs to be dedicated to helping you.

Independent professionals are usually local business people who rely on the word of mouth of their customers to succeed in business. The fact that if they don't treat people right, they don't eat, is a pretty big incentive. However, more often than not, they are genuinely caring and committed to offering the very best service.

Independent hearing aid providers offer high levels of service and aftercare as standard. Normally they have set up their own businesses in order that

they can do just that. National hearing aid providers are getting better and better at looking after their customers, however, everything within those providers is usually to a rigid plan.

Independents are truly flexible in their approach, delivering the service and aftercare that is needed when it is needed. You probably won't find many others who are as committed to ensuring you have the best experience. On top of that commitment and because a hearing aid provider is Independent, he or she does not have to march to the company guidelines when it comes to providing hearing aids.

It simply means that they will recommend hearing aids that are right for you and your lifestyle needs. Hearing healthcare professionals in National businesses will always try to do the same but because of company policies and changing commercial arrangements they may have to do so within a limited choice.

Hearing Tests

The quality and comprehensiveness of the hearing test is important. You should get a complete hearing test undertaken by a qualified professional before buying a hearing aid. There are many test that can be undertaken, the benefit delivered of different test procedures like speech audiometry and speech in noise testing to the eventual fit of a hearing aid was once debatable.

However, with recent changes in hearing aids and understanding of hearing loss the more in-depth the test is, the better the recommendation and eventual fit. Information derived from speech testing and speech in noise testing in particular is very valuable in understanding which hearing aid is best for you.

This information can also be incorporated in the fitting of the hearing aid delivering a better personalisation for you. Ideally audiological tests should be done in a soundproof booth for complete accuracy, or at a stretch a very quiet room.

The consultation should also incorporate more than just testing procedures. To understand your hearing needs, an Audiologist should discuss your medical history, lifestyle needs and the issues you are having.

After the test is finished the Audiologist should explain to you the severity of your hearing loss and what type of loss it is.

At this point they should be able to recommend to you which kind of hearing aids and which technology level will work best for you, your lifestyle needs and your loss. Let's take a look at the hearing test and the different processes. The hearing test appointment will usually last between one and one and a half hours. The test is made up of several different overall parts that allow a professional to understand the full background to any hearing loss. Any medical issues pertaining to your hearing and then your ability to hear.

Each part of the process is designed to furnish different information that is

then used to make recommendations. Each part of the process has a certain value and will shape the recommendations made. After the hearing test is complete, the professional will explain clearly what he or she has found and will make recommendations on those findings.

What happens during the hearing test?

Generally the hearing test no matter where you get it, will follow the same pattern with similar components.

Components within the overall parts may differ based on who is providing the test and the results they are getting. For instance, some professionals may not undertake speech in noise tests at all, and middle ear testing may not be undertaken unless something points to it being specifically required. Having said all of that, the hearing test will usually include:

- Examination of the ear and auditory canal, including video otoscopy
- Case history
- Full audiometric hearing assessment that will include pure tone testing, middle ear testing and possibly speech testing in quiet and noise.
- Explanation and discussion of outcome
- Impartial advice on the most suited hearing system for your individual requirements

Let's talk about those stages in more depth.

Otoscopy (Examination of the ear)

This part of the assessment is about the health of your ear, your outer ear and your ear canal. The professional will first examine the outside of your ear using a light. They are looking for any blemishes strange marks or sore spots. They will then use an instrument called an otoscope to examine your ear canal and your tympanic membrane (ear drum).

This again is to check the health of your canal and ear drum. They will check something called the light response on the ear drum, this is simply

the way the light is reflected on the drum. A healthy tympanic membrane will reflect the light in a specific way. This examination may also give indications of problems with your middle ear and indications of any history of perforations.

It also allows a professional to become a little familiar with your ear canal. Each ear canal is different, different sizes, different bends. Once the professional is happy, they will move onto the next part.

Case History

A case history is taken to get an understanding of the background of your hearing loss. During the case history you will be asked typical questions such as your name, address and date of birth. They will ask you about any treatments in the past that may have used ototoxic drugs (medicines that are toxic and damage hearing).

Then the professional will ask you questions about any background to the hearing loss, such as your working history, when you noted an issue, if the issue occurred suddenly, has it worsened suddenly, do you have tinnitus, if so is it in only one ear etc.

These last few questions are designed to allow the professional to assess if you have what is called a referable condition. If they find this to be so, they may well continue the test but will refer you on for further examination by an ENT professional. Once this is done the professional will also ask you questions about the perception that you have of the impact of your problem on your daily life.

These questions are important because it allows the professional to begin to understand your lifestyle and the impact if any that hearing loss is

having on it. Sometimes these questions may seem odd, but to get a good understanding of what is best for you, we need to have a good idea of who you are and what you enjoy doing. After the case history is undertaken, they will move onto the auditory testing proper.

Auditory Testing

Auditory testing is made up of several tests that assess the full function of your auditory system. It is important that the testing is comprehensive, but certain parts of the test may not be needed depending on results from earlier tests.

What happens during auditory testing?

As we said, not all tests may be undertaken, for instance, masking and middle ear analysis may not be needed, however, best practice auditory testing involves the following tests:

- Pure tone testing (audiometry)
- Masking (audiometry)
- Speech in quiet testing
- Speech in noise testing
- Tympanometry
- Acoustic Reflex Threshold testing
- Distortion Product Otoacoustic Emissions (DPOAE) testing

Audiometry (Hearing Test)

Audiometry or pure tone testing is a series of tests where pure tones (sound like whistles and chirps) or warble tones (similar but they oscillate or vary) are presented through either headphones, insert earphones or a bone conduction head band. It is important that both air conduction (through headphones) and bone conduction (through bone conduction headband) are both undertaken.

Air conduction audiometry tells us what you can hear from the outside in, bone conduction audiometry tells us what your best inner ear can hear in isolation. This is important, because sometimes there can be a difference

and this is the clearest method to identify if you have either sensorineural or conductive hearing loss or indeed a mixture of both. The results are plotted on an audiogram which shows your hearing sensitivity in the tested frequencies. These tests tell us the softest sound that you can hear and allows us to tell you if your hearing sensitivity is within normal range, or if there is a hearing loss.

Audiometry results tell us many things beyond just your hearing sensitivity, it allows us to see if there is any asymmetry in your hearing loss (hearing sensitivity that is not equal between the two ears). It also allows to see the configuration of your hearing loss (the shape of the way your hearing loss occurs tell us a lot about your hearing loss causes). This and other tests can help towards a diagnosis of ear abnormalities.

How is audiometry performed?

The initial test involves you carefully listening through headphones (air conduction) that are placed over the ears or insert earphones that are placed in the ear canals. Pure tones will be presented through the headphones or insert earphones. This part of the test is called air conduction testing and is designed to allow the professional to assess what you can hear from the outer ear.

If you hear the sound, you will push a button or raise your hand in response. The professional will continuously reduce the volume of the sound until you can no longer hear it.

The key here is that the professional is trying to identify the softest sound you can hear, so no matter how soft it is, if you think you hear it you should push the button. Many people are never sure and feel like they are letting down the professional.

This couldn't be further than the truth, just relax and don't get frustrated. Once the headphone or earphone test is undertaken, the professional will then change to a bone conduction vibrator on a headband that is placed behind the ear. This part of the test is designed to find out what your inner ear can hear, it is very rarely different but in cases of conductive hearing loss there will be a marked difference. This part of the test is important,

conductive hearing loss is a referable condition if you have never been aware of it before. Even if you know about it and it has been assessed by an ENT, the results are still important for the programming of any hearing aids that may be prescribed.

This overall test will determine your hearing thresholds and would normally

be the end of the audiometry testing. However, just occasionally the results will point us to undertake advanced audiometry. This is where we earn our money!

Additional tests called masking may be added to the group of tests if an asymmetry of thresholds is found or if you have conductive hearing loss. Masking is very important and there are clear rules when a professional needs to do it. Masking is designed to keep one ear busy, while the other is tested. In essence it is only undertaken where we do not trust our original results.

As I said, there are clear rules on when we should mask and when we should not trust results. You will know masking because the professional will play a white noise type sound in one ear which they will tell you to ignore while they ask you to respond to the normal beeps or whistles in the other.

Speech Testing

Words will be presented at a comfortable listening level either free field which is presented through a calibrated speaker, or through headphones. You will have to repeat the words and the professional will score you on the results. This test gives the professional a deeper understanding of how you hear speech, it also identifies the speech sounds you are missing.

The test will then be undertaken with increasing levels of background noise. This test is an important part of the assessment, it will give the professional a lot of information about how you perceive speech and the signal to noise ratio you need to hear and understand speech in noise.

These types of tests have always been done, however, in the last few years speech in noise tests have become more helpful to us. A test like Quick SIN

allows us to understand the signal to noise ratio that you will need to hear speech well in noise.

Why is it important?

The level of sound you hear is only a starting point for our understanding of the impact of your hearing loss. This just tells us the mechanics of the sound levels. Speech testing actually allows us to understand how well the brain centres that manage hearing are working.

It is often the case that speech scores can be radically different between two people, even if the audiogram results are the same. The speech in noise testing also allows us to understand exactly what type of hearing aid technology level is most suitable for your hearing loss. For best diagnosis and hearing aid recommendation, the speech testing protocol has become a must.

How is speech testing performed?

Most independent hearing health professionals have updated their testing equipment to allow them to run automated speech and speech in noise tests through their audiometer. During these tests you will be asked to repeat words that are presented to you at normal speech volume levels with and without noise.

Word recognition scores will be determined and recorded on their system. The Quick SIN test will give a signal to noise ratio score which will give a professional a clear idea about the hearing devices that will help you in noise.

Middle Ear Analysis

Middle ear analysis tests are undertaken to assess the function of the middle ear. The tests will assess how sound travels through your middle ear and also how your brain reacts to some sounds. You will feel a short blocked sensation while a recording takes place.

These tests are not necessarily important, they only become important if there is a clear need for them. So if I have identified that there is some sort of mid ear issue, Tympanometry will help me understand what that issue might be.

Tympanometry itself will not have any bearing on the hearing aid that is fitted, the audiometric results will. There are two parts to the Middle Ear Assessment: Tympanometry and Acoustic Reflexes.

Tympanometry

It consists of measuring how much your eardrums are moving and if that movement is within normal limits. It tells us if there is any fluid or congestion behind the eardrums. (presence of fluid behind one's eardrums is known as glue ear, and it is very common in children).

This test measures how well your middle ear works. Your middle ear includes your ear drum, the middle ear bones, and your Eustachian tube. It will reveal abnormalities which will signify and can explain a conductive hearing loss and/or a sensation of pressure in the ear.

How is tympanometry performed?

An ear tip is placed in the canal that is connected to a handheld machine, it briefly varies the pressure in the ear. By varying the pressure, the movement of the eardrum can be measured. It takes only a few minutes to complete. You will not need to respond during this test.

Acoustic Reflex Thresholds

When we hear a loud noise, our ear protects itself with a reflex which stiffens the eardrum. We use this reflex to test the Facial and Auditory nerves. This test measures how the stapedius muscle contracts in response to a loud sound. The absence or presence of acoustic reflexes can be important for differential diagnosis.

How is acoustic reflex threshold testing performed?

Often, tympanometry and acoustic reflex thresholds are done together.

With the ear tip in your canal, you will hear beeps that are progressively louder. You will not need to respond. Instead, the machine will automatically measure the response.

Distortion Product Oto-acoustic Emissions (DPOAE)

This test measures how well the outer hair cells in the cochlear work. The outer hair cells produce low-level sounds called Otoacoustic Emissions in response to clicks. A conductive or sensorineural hearing loss will often result in absent DPOAE responses.

How is DPOAE testing performed?

With an ear tip in the canal, clicks are presented in the ear. In response, the cochlear emits a sound which is recorded by the equipment. The extent of the response and the frequency at which the response occurs is measured and recorded.

Explanation of the results

Once the testing is complete, the professional will explain the results, they will explain exactly what they have found and detail why it is having the impact it is on your life. They will also make recommendations based on their results in order for you to return to a more normal level of hearing and allow you to engage fully in your life.

Hearing Aid Benefit Assessment

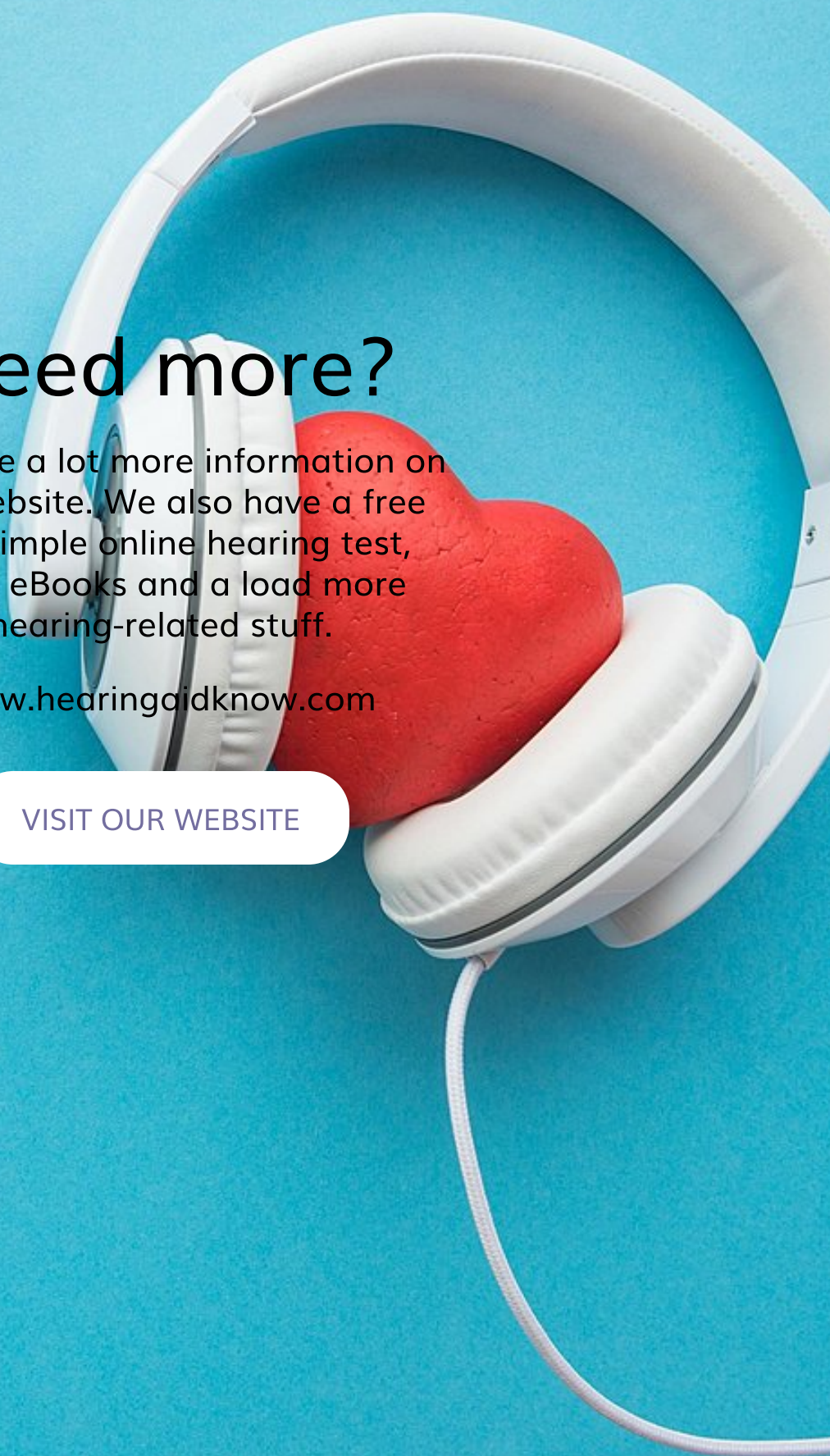
If you are a suitable candidate for hearing aids, many professionals will then move onto a hearing aid benefit assessment or demonstration. In essence what they will do is programme up a set of demo hearing aids to your loss, they will not give you full amplification but a level close to it. This will allow you a taste of what hearing aids sound like and how they will work. Any professional worth their salt will move through a demonstration of different features explaining to you as they go what they are and how they will work for you.

Go To The Test Accompanied

You should always take someone with you to your hearing test, undergoing

any kind of medical examination or procedure can be a stressful. It is always a good idea to take someone with you to a medical appointment. Whilst caught up in the process and worrying about results, it is easy to miss other important information. If you have someone with you they can help to remember what was said. It is always better to have two people in order that as much information as possible is retained.

Make notes during the appointment and don't be nervous about asking questions. Query anything that you do not fully understand. Conversely, don't be afraid to ask the Audiologist to write something down for you. A true professional will not be put out by being asked questions, these questions will come up, it is better to ask them at the appointment. As a professional we understand that this experience is new to you and the information is foreign.



Need more?

We have a lot more information on our website. We also have a free and simple online hearing test, more eBooks and a load more hearing-related stuff.

www.hearingaidknow.com

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