Simple Clear Advice on Hearing Aids

THE LITTLE BOOK OF HEARING AIDS

By Geoffrey Cooling
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Introduction

Privately provided hearing aids are a significant investment, I want to give you the knowledge to make that investment with confidence.

I regularly correspond with buyers of the book, and I thoroughly enjoy the feedback. I wrote this book initially because I wanted to make sure that there was a good, impartial source of information available to people.

It is precisely the same reason I got involved with the website Hearing Aid Know. In this book, I have again updated the information given and expanded it to include some of the latest developments.

My background is relatively simple, I have been involved with hearing aids for over ten years, and they continue to fascinate me. I was a qualified hearing aid audiologist in private practice in Ireland, before moving to work for a major hearing aid manufacturer. I am now back in private practice, operating in Dublin, Ireland.

I collaborate with a guy named Steve Claridge on the website, Hearing Aid Know. We want to bring clear, honest advice to consumers centred on hearing aids and the people who provide them. I like to talk straight, laugh at gobshites (Irish technical term), and my sense of humour may well get on top of me. However, bear with me, and I am usually able to translate the gobbledygook.

What follows is a relatively high-level look at hearing aids, their technology levels, their pros and cons and the features inside. I hope that this will give you the complete grounding in the subject that you need to make educated decisions. In one review of this book, it was said that I don’t make a comparison of hearing aid brands.

I don’t, it would make the book about a thousand pages long. I see my job in this book to give you a high-level understanding of what should actually matter to you. I also try to make sure I at least touch on the latest and best hearing aids from the major manufacturers. Without actually physically seeing you, I can’t make a comparison and recommend the best for you. It is just impossible.
All I will say is that each of the major hearing aid brands offers relatively outstanding hearing aids that do what they are supposed to. Where I personally have tried hearing aids (I have a moderate high-frequency hearing loss), I will talk about my experiences.

In one of the reviews given for one of the books somebody said I was encouraging people to go to Audiologists. In the UK and Ireland, we don’t have the same set up as in the US. We are all Hearing Aid Audiologists. There are no Hearing Instrument Specialists and Doctors of Audiology here. So while I might have mentioned Audiologists in the text, it wasn’t meant to be a recommendation to see an Audiologist in the states.

My feeling, in general, is that you should go to the person who has excellent reviews, no matter what their level of qualification. In my experience, I have seen Hearing Aid Audiologists, Hearing Instrument Dispensers and Doctors of Audiology who were halfwits who I wouldn’t let treat my dog. So the level of education is no guarantee of efficacy. The second thing is you should ask them do they Real Ear Measurements or Speech Mapping of hearing aids. If they say no, tell them you will go somewhere else that does.

You can read more about hearing aids and the people who provide them on our website at Hearing Aid Know
The Lies We Tell Ourselves
Hearing loss just happens; the best thing to do is deal with it. I wrote on the Hearing Aid Know site about the lies we tell ourselves about why we don’t need hearing aids, and I want to detail them here.

My Hearing Loss isn’t Severe Enough
Hell no! Your wife or husband is about to strangle your ass. If she or he has to repeat themselves one more time she will happily kick you until your unconscious, unconscious I tell you!

Even a Mild Hearing Loss
Apart from your wife or husband harbouring homicidal thoughts, we now know that even a mild hearing loss needs to be treated. In fact, recent evidence that has come to light about untreated hearing loss and cognitive decline frightened me so much I started wearing my hearing aids all the time.

Hearing Loss & Cognitive Decline
Let me explain, we as professionals were always worried about the broader effect of hearing loss on general health and emotional well-being. In the last few years, though, evidence has come to light that connects untreated hearing loss to more rapid cognitive decline and possibly dementia.

The evidence has made us as professionals change our own thoughts about intervention in hearing loss. We are now recommending hearing aids even for mild hearing losses that we may not have before.

So, it's pretty simple, if you have a hearing loss at all, you should really think about treating it with hearing aids if they are appropriate.

Hearing Aids are Uncomfortable
Yes, that's right; they are strange at the beginning. You have never worn something in your ear all day before. Why in hell would they not be uncomfortable or foreign?

That feeling will fade with a little time. If it hasn't disappeared in a week, you may need to be re-sized. Generally, it is a simple process. Stop using excuses because you don't like the idea of wearing hearing aids. Time to get over yourself, which brings us onto.
I would be Embarrassed to Wear a Hearing Aid
So, I understand that actually, I don't feel it, but I do appreciate it. For me, it is a simple equation, need hearing aids, gets them. I really don't give a toss what other people think, in fact, I am probably famous for it.

But, I do understand that other people don't see it as that simple for them. They see having to wear a hearing aid as some sort of statement on them, the ageing process and their worth. Honestly, is it more embarrassing to be in control of your own ability to communicate or to stumble through life trying to bluff something while everyone knows you have a problem?

That's all arse (Irish technical term) complete and utter arse. A hearing loss is not a statement on you, on who you are, or how old you are, it merely is. No more and no less. It is a problem that is causing you real issues. Not doing something about a hearing loss that is affecting your life, now that is a statement about you.

Honestly, is it more embarrassing to be in control of your own ability to communicate or to stumble through life trying to bluff something while everyone knows you have a problem? Because believe me, everyone knows you have a problem.

Exactly What You Are Missing
Let's think about this, what are you missing, what are you losing out on by not dealing with your hearing loss? The whispered words of a loved one, the pure joy of a particularly moving piece of music, the words of your Grandchildren, the pleasure of easy social contact.

So much of the joys of life are based on communication and engagement. Robbing yourself of the ability to be genuinely involved is just damn stupid. Are you stupid? You are reading this book, so I imagine you probably aren’t.

The Joy of Easy Communication
How much do you miss the joy of easy communication, getting the joke first time, instead of them having to repeat themselves? The frustration of having to ask someone "what did they say?" The sitting in a room of people you love while being almost completely isolated. The simple joy of easy conversation.

You know the next time you are tired and worn out from the effort needed just to listen? You know that feeling of stress, that feeling of being overwhelmed? You know the simmering strife in your home life because the people you love are at their wits end? Well, most of that can be easily dealt with by using hearing aids.
Damn it, Reclaim Your Life!
Reclaim your life, it is as simple as that, are you ready to pack up and die? Well if you aren’t, get on with living.

I do not want to admit a hearing loss in public
Why? I go back to my last statement; everyone knows you have a hearing loss. Believe me; they knew long before you really did. So what are you anxious about? You are concerned about being embarrassed, but believe me, and you know it well. You will be more embarrassed by getting everything wrong, asking people to repeat themselves and generally looking like you are doddering a bit.

Yup, doddering! Let me ask you this, which looks older and a little senile? A person who seems to be always forgetful, who asks others several times to repeat themselves, gives the wrong answers to questions, always confuses words and continually goes on about how people didn't mumble so much in my day.

Or, someone who takes control of their ability to communicate lives an active social life and is generally happier with their lives? Think about that, I know what the right answer is, and so do you.

Hearing Aids Do Not Work in Noisy Environments
Yes, they do, especially if you buy the right level of technology for you. Simply put, if you want to hear well in complex sound situations, you need to think about the top two tiers of hearing aid technology. Does that mean that the bottom two levels of technology won't help you?

No, it doesn't, they will help you a great deal, especially if you use something like a remote mic to give you an extra bit of help. Hearing aids will work to provide you with the sound cues you need to understand what is being said. Will they allow you to hear everything in a really noisy situation? Maybe not, but you have to realise that even people with perfect hearing have problems with noise sometimes.

The key to being happy with your hearing aid purchase is to be realistic about what you should hear with them. You need to be realistic about your expectations of the hearing aids you buy as well. A good professional should guide you on this, they should try to make it clear what the hearing aids can be expected to deliver.

I Have More Serious Priorities
Actually, you probably don’t, back to what I was talking about earlier. Our new understanding of the effects of hearing loss on general health and cognitive function makes treating hearing loss a priority. As I said, we have changed how we think, and we are recommending the treatment of even mild hearing loss.
I do understand that there may be other things going on in your life, things that make it challenging to consider your ability to hear as a priority for you. But your ability to hear is your ability to communicate with ease. That has an effect on all the different parts of your life.

They don't Restore Your Hearing to Normal
I am afraid nothing can restore your hearing to normal, but hearing aids do a damn good job at giving you normal levels of hearing. They are the difference between hearing what is being said and saying what? All the time. They will allow you to communicate freely and easily.

I Hear Well Enough in Most Situations
Yes, about that, nope. Ask your long-suffering family about that. One of the things I hear often is that I hear well in one to one situations. Generally, people with hearing loss do okay in one to one situations where their companion is facing them, and the face is well lit. With no competing noise and full view of the person's face, they get on okay.

However, we do a simple speech test with many people, words presented at normal speech levels. Of course, there are no visual references, so they are relying on their hearing only. When they have gotten three out of five or six out of ten words wrong, they suddenly realise they aren't doing as well as they thought they were.

Damn it be a grown up
Yup, enough prevaricating, enough lying to yourself, enough excuses. You owe it to yourself and your ongoing health and happiness. Hell, you owe it to your long-suffering family. Time to put your big boy or big girl pants on. This is too important to hide behind bull, believe me when I say it. Hearing loss isn't a statement of who you are, not getting proper treatment for it and trying to bluff is.
Providers of Hearing Aids

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. That choice has grown in recent years beyond the two traditional outlet types.

There are corporate type providers such as Amplifon, Hidden Hearing, Boots and Specsavers in the UK and Miracle-Ear, Hear USA, Costco and Beltone in the US.

There are also Independent providers who may be sizeable multiple branch outlets or smaller single outlet businesses.

In the recent past, we have seen another type of provider arrive, the Online Provider. They offer savings based on the fact that they have no shop front and small overheads.

In the next few pages, I would like to explore these outlet types and explain the pros and cons of each one of these very different provider types.

Corporate Providers

In my experience, Corporate providers generally offer a pretty good service including on-going aftercare, although with many the experience can be a bit like being on 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, which is how they survive.

Pressure To Sell Specific Products

There will usually be some pressure on staff to sell one product line specifically in most corporate chains. Again Amplifon was 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, as is Costco in the states. There are very few genuinely Independent corporate retail organisations in hearing care.
**Arrangements with Manufacturers**
They have agreements with particular manufacturers, and those arrangements mean that certain brands are more advantageous for them to sell. However, as long as I was in Amplifon, Corporate Management didn't interfere at the macro level. They simply allowed Dispensers to sell whatever they felt was best for the Patient in front of them.

**Owned By Hearing Aid Manufacturers**
Many corporate providers are, in fact, owned by hearing aid manufacturers. While some of them may have different hearing aid brands on their price lists, they are more likely to sell you the brand that owns them. The fact that a business is owned or part-owned by a hearing aid brand is very rarely obvious or publicised.

For instance, Boots in the UK is owned by Sonova, the owners of the Phonak and Unitron hearing aid brands. In the US, Sonova owns Connect Hearing. Hidden Hearing (another UK company) is owned by William Demant, the owners of the Oticon Brand.

Beltone in the US is owned by GN Resound. It just isn't these hearing aid brands; every major hearing aid brand has some sort of retail arm. This type of vertical integration is only increasing within the business, more and more manufacturers are buying retail outlets.

**Limiting of Choice?**
I believe that this vertical integration limits your choices, the equation is simple, and 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.

It isn't that I think that is a bad thing; I just feel that you should be clear on it. The business 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. The standard of care can still vary, just as the standard of care provided by Independents can vary. Another problem with Corporates is that there can be a good bit of staff turnover so you may buy from one person, but end up being seen by another at a later date.

I know that some people find that off-putting, they like to stay with the person they trust, especially if they have built up a relationship with them. However, the fact that Corporates have multiple branches and staff can also be a pro.
If for instance, you are travelling in the UK or across the US, if your provider has an outlet wherever you are, they will see you as a customer if you get in trouble with your hearing aids.

It is also worth considering that if you have issues with the person who supplied you with the hearing aids, there are also other staff members to take care of you. These things do happen, and I personally have seen them happen many times.

So there are pros and cons to dealing with a corporate entity, just as there are pros and cons to everything.
**Independents**

Independent providers are just that, 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.

**Access to All Products**

Independents generally have access to all of the big hearing aid manufacturers, however, in practice, they will usually only use perhaps three brands at most. There will be a primary brand that they deal with 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 the efficacy of devices and perhaps specialisation.

I have said before, that if I were running my own Independent practice, I would probably choose Widex, Phonak and GN Resound as my three suppliers. However, that decision has become harder for me. Since I said that, both Oticon and Signia have introduced technology that really interests me. So my choice would be a little harder now.

I would try to choose the brands that were able to provide me with pretty much everything I needed to meet the needs of my customers as they presented to me. 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 is the one manufacturer who offers an outstanding and versatile made for iPhone power hearing aid.

So it makes perfect sense for me to discuss these brands with someone who needs a powerful 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.

**Freedom to Offer Best Service**

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. I
think that is the best way to serve the customer, and indeed, the best option for the
customer.

**Local Business**
Most Independents are local businesses, they often live local to the community they
serve. That is the way business used to be done; you did your business with someone
from your locality, which meant that the money was in general kept in your area. More
than that, you knew who you were doing business with. You might not have known
them personally, but there was always word of mouth through the community.

**Service Instead of Advertising Budget**
Independent businesses tend not to have massive marketing budgets. Their success is
generally built on service and good word of mouth. They don’t survive unless there are
both. Independent professionals usually rely on the word of mouth of their customers
to succeed in business.

The simple fact is that if they don't treat people right, they don't eat. That has to be
seen as a pretty big incentive. However, more often than not, they are genuinely caring
and committed to offering the very best service.

**Often Higher Levels of Care**
Independent hearing aid providers offer high levels of service and aftercare as standard.
They usually have set up their own businesses so 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 genuinely flexible in their approach, delivering the service and
aftercare that is needed when it is required. 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 merely 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.

Of course, those are all pros, but what about the cons of dealing with Independents? If it
is basically a one-man show, there could be issues with continuity of service. God forbid
he or she gets sick, is injured or dies, who will continue to look after you?
If you have issues with your devices while you are travelling, will you have access to help? In fact, that depends, if the problem is with the failure of your hearing aid, then you will probably be able to get it fixed under your warranty elsewhere.

Your International Warranty will cover you for such repairs during the warranty period. However, there may well be a handling charge for it. After all, you aren’t a customer of the Practice that is organising the repair and post, and packaging needs to be covered.

For anything else, such as diagnosis of issues, adjustments, wax traps, batteries etc. You will have to pay or negotiate a local price.

**Online Hearing Aid Retailers**

In recent years there has been an explosion in online hearing aid providers. Initially, the online providers were in fact, little more than lead generation sites. Their only business was to get your name and address and sell it on to a company local to you. While that model still exists, there has been a divergence in the space in the recent past.

**Buying a Hearing Aid Online**

The sales of hearing devices online are not new, there are businesses around the world that sell hearing aids online direct to consumers. In fact, some of those businesses do an excellent job of it, in the main because they have that infrastructure in place to ensure the buyer's success. That infrastructure involves remote testing of the buyer's hearing and remote fitting and fine tuning of the devices.

However, that is not the case with all online hearing aid retailers. Some of the new online retailers are offering hearing aids from the big hearing aid brands, hearing aids that were never designed to be sold online. Let’s talk about online retailers. There are now three types of online hearing aid retailers, they are

Lead Generation Sites

Co-operative Groups

Hearing Aid Retailers

The lead generation sites don’t really need much description, they are merely there to attract you to them, get your name and address and then sell it on to someone in your area. The others are a little interesting and work differently.

**Co-Operative Groups**
Co-operative groups have mostly spawned from the lead generation sites. They are in essence a group of hearing aid businesses (usually Independents) who are co-operating to drive a website which brings in business.

There is centralised control of the website and enquiries are sent to the nearest hearing healthcare professional in your area.

**Hearing Aid Retailers**

There are now several true online hearing aid retailers, some of them such as Blamey & Saunders or Eargo manufacture their own hearing aids and sell them online to the public. Some, however, sell hearing aids from the big six hearing aid brands. These types of business usually do not have a network of Audiologists that they work with, although, that is beginning to change.

I don’t think online sales of hearing aids are a terrible thing when there is an infrastructure set up to cater for it. By that, I mean that online sales are supported by a testing and fitting infrastructure either online or offline.

For instance, Blamey and Saunders in Australia deliver a system I would support as does iHear and Eargo in the US. These companies have purposely set themselves up and designed their technology to be offered online. The support and infrastructure to provide it are clearly there.

Up to recently, I would not support the sale of hearing aids from the big brands in an online manner. Mainly because they were not really designed to be sold in that manner. The underlying technology to do this well with the leading hearing aid manufacturers just wasn’t there.

That has begun to change, more and more of the hearing aid brands offer remote care systems. Basically telecare systems which allow remote fine-tuning of hearing aids. Looking after someone remotely has become far more manageable. Therefore, I now believe that online sales of main brand hearing aids can make sense. There are of course caveats, let’s look at them.

**What You Need To Know When Buying Online**

So here it is, this is what you need to consider when buying online, and the first and most important thing is you need a proper hearing test. It is essential that any hearing aid fitting is based on a reliable hearing test. Secondly, hearing aids are not like glasses. You don’t just put them on, and everything is lovely. It doesn’t work like that, unfortunately.
You will need ongoing care and attention to get the very best out of your hearing aids for as long as you have them. That may well be up to eight to ten years. If you feel confident that the online retailer can give you that care and service and is committed to doing so, then you are onto a winner.

It is both my experience and the experience of Steve that to get on well with hearing aids people generally need the involvement of a good hearing healthcare professional. We have said it here before, our worry about buying hearing aids online was that people may buy the hearing devices and then find it difficult to get a professional to help them if they need it.

While telecare is pretty good, it isn’t going to solve every problem that may arise. So there are several things you really need to consider so you can make an educated choice before buying.

**What You Need To Think About When Buying a Hearing Aid Online**

- You need a good in-depth hearing test
- Hearing aids aren't glasses, they don't just work
- You will need ongoing care
- How will you understand what are the best hearing aids for you?
- Will someone make a recommendation on the best hearing aids for you?
- Will someone fit them for you?
- How much will the hearing test and fitting cost?
- How much will it cost for aftercare visits or telecare visits? (you are going to need them)
- How much will it cost for repairs to be handled?
- Finally and the big one, will the extra costs of getting someone local to help you mean a net saving or loss for you?

It struck me that the question I should answer is "Would I be happy to sell you hearing aids online?" That is the real test, isn't it? So I should answer it, I would be happy to sell you a hearing aid online if, and it's a big if, the hearing aid manufacturers made the technology available that allowed me to do an in-depth hearing test.
Allowed me to do a full fitting and verification of the hearing aids and finally and probably most importantly, that I was confident that you were able and tech savvy. Right now, those conditions don't exist, so No, I wouldn't sell you a hearing aid from one of the prominent manufacturers online right now.

**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, and 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 are absolutely imperative to your ongoing experience. For you to get the best out of any hearing aids you buy; you will need a committed and skilful 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 were to give you full amplification (the prescription you needed to correct your hearing), you would run screaming from my office. You wouldn't like it one bit, you would find the level of amplification overwhelming.

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 time, which really does vary from customer to customer, I will then increase the amplification to your prescription level.

Not every Professional will follow this protocol. Modern hearing aids have an auto-acclimatisation feature. It is a feature that I can set, at the first fitting which will gently turn the hearing aid prescription up towards your prescription level over a controllable and customizable level of time.

I use the system; however, I still like to see the customer during this period to assess the increase and to discuss the changes and their experiences. I believe that this is the best way to serve my customers.

The prescription that is used is based on your individual hearing loss. The prescription is based on thousands of hours of research and thousands of ears. It is an excellent starting point. However, everyone is different. I have found that most people need further personalisation of their prescription to get the best out of their hearing aids.
So, with that in mind, even when you get to your prescription level, which I will validate with Speech Mapping (more about that later). You still need some tweaking. I think this makes the situation a bit clearer, and it is why you can’t compare hearing aids to glasses, or perhaps any other device. Let’s talk about customization of sound.

**Think it’s Over Then? Think Again**

As I said, the prescription isn’t when the fat lady sings. Generally, your prescription level is just a starting point, a good starting point but merely a starting point. Hearing is a very personal sense, and appreciation of sound differs. I like classical music my wife thinks it is noise. Each one of us is slightly different, unique in a way. 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.
Buying a Hearing Aid
Purchasing a hearing device is a big decision on many levels; firstly there is a significant financial outlay involved. On top of that is the psychology that seems to be inherent in the decision. It never fails to surprise me, the deep thoughts and stigma around hearing aids, but you aren't old, it isn't a sign of you losing it, it simply is. Let’s take a look at the psychology of it.

The Price is Important, But so are Other Factors
Many first time buyers focus on the price of the instruments, I can understand that because they tend to be expensive. There are many other factors that you need to consider when you are thinking about buying hearing aids.

But let's focus on the price for a minute; generally, the price of a hearing aid includes a lot of services, in fact, years of it. For years I have spoken about unbundling prices, so it is clearer precisely what you are paying for, not many have done it. I believe that will probably change though as pressure to justify cost increases.

The price of hearing aids I charge to you is based on a simple calculation:

\[
\text{Hearing aid cost} + (\text{How much my time is worth} \times \text{how much time I spend with you}) = \text{Hearing Aid Price}
\]

I will go into the price considerations in a more in-depth manner later, but here I want to give a quick overview and talk about White Label hearing aids.

Hearing aid price breakdown
An understanding of the price structure is essential, so what are you paying for? Generally and certainly in the UK and Ireland, you are paying for the hearing instrument itself and all of the care and support that you are expected to be given for the lifetime of the device.

All of the private hearing aid dispensers in the UK and Ireland offer a similar service. Professionals in the US generally provide precisely the same thing. You need to be clear on what is on offer to you, though.

Because with that knowledge, you can make an educated decision. The general Patient Journey that is on offer is as follows:
The fitting of the hearing aid
The first fitting appointment is then followed by fine-tuning visits to ensure the aid is customised for you (perhaps two or three). The last appointment in this cycle should also involve Real Ear Measurements. These are crucial visits, and during this time, the basis for the success of your hearing aids is set.

Either six monthly or yearly follow up appointments to service the aid and ensure you are still doing fine from then on. During these visits you can expect to have your ears checked, the hearing aids checked and at least once a year your hearing checked.

The lifetime of a Hearing Aid
You may hear it said that the lifetime of a hearing aid is four to five years, that’s not true. Generally when people talk like that, what they actually mean is that the lifetime of hearing aid technology is four to five years. By that, I mean that innovation in the hearing aid world tends to move in four-year cycles. Every four to five years, something new comes out that is truly extraordinary in comparison to what went before.

The lifetime of a hearing aid, however, can be up to about ten years, after eight it can become challenging to get it repaired if it fails. So during that period, you are going to attend a lot of half hour to hour appointments with your hearing professional.

That is precisely what you are paying for, time and professional expertise. When you have paid for it, don't be embarrassed about taking it up. I think that my time is worth money, just like any other professional who offers service, when you have paid me for that time; I always make sure that you get it.

Going For the Cheapest Price?
There can be a disparity in prices across different providers, and it can be attractive to go for the cheapest option. What you have to ask yourself is, "is it like for like?" This is the most critical question that you need to ask yourself; later, in the hearing aid section, I discuss hearing aids and their technology levels. I do that so that you can consider this question in a more educated manner.

The lowest price is not always the best option; you need to know all the facts surrounding that price and the equipment and service offered before you can make an educated decision. What service will be provided, what exactly are the hearing aids, are they the latest technology? Will the professional use Real Ear Measurements to verify or validate that the hearing aids are working as they should? When you have answers to these questions, it is easier to make decisions.
**White Label Hearing Aids**

Some corporate providers offer white label hearing aids, white label hearing aids are devices made by manufacturers with a unique label. For instance, Specsavers has the Advance range, Hidden Hearing has their own range which is made by Oticon, in the US Costco has the Kirkland range which was created by Resound and is now made by Signia. Starkey does its own white label for its retailers.

I personally don't like white label ranges, I understand the commercial reason why they are used, but it makes them hard to analyse for the consumer. That is precisely why a white label is used, to make it difficult to do like for like comparison. It is easy for a Dispenser to say oh they are the same as such and such, more often than not, they aren't.

They may be made by the same manufacturer, but how are you to know what they are exactly? The information is never really forthcoming, maybe it is my natural sense of suspicion, but why do they need to hide the brand name in the first place?

So there is a lot of information to take in when you are buying a hearing aid, and it is easy to feel overwhelmed by the sheer amount of information that you need to consider. That information is both medical and technical in nature, medical when it comes to your hearing loss and technical when you are trying to understand any hearing aid technology that has been recommended.

There is a lot of choice in both types of hearing aid available, and the manufacturers who make them. It can be quite difficult for a consumer to understand it all and sort through what is essential. A good Dispenser will help you on that journey, deciphering the gobbledygook. Before we move onto hearing aids and their technology, I want to take a look at the experience of buying a hearing aid, what should happen, and why.
The Hearing Test
The quality and comprehensiveness of the hearing test are essential. You should get a complete hearing test undertaken by a qualified professional. Our understanding of your ability to hear is built up through many different criteria. The benefit delivered of varying 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 our own 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 valuable in understanding which hearing aid is best for you.

This information can also be incorporated into the fitting of the hearing aid delivering 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. Although with the advent of new types of audiometers designed to eliminate outside noise that is actually beginning to change.

The consultation should also incorporate more than just testing procedures. To understand your hearing needs, a hearing health professional should discuss your medical history, lifestyle needs and the issues you are having. After the test is finished, the professional 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 hour. 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 about 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 piece of the process has a specific 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 analysis 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 conducted 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
- A full audiometric hearing assessment that will consist of pure tone testing, middle ear testing and possibly speech testing in quiet and noise.
- Explanation and discussion of the 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 (eardrum).

This again is to check the health of your canal and eardrum. They will check something called the light response on the eardrum; 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 signs 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 to the structures of the inner ear).

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 referrable 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 essential because they allow 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 hearing system. It is essential that the examination 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 a set of headphones, insert earphones or a bone conduction headband. It is
essential 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 most precise 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 the 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 (a hearing sensitivity that is not equal between the two ears). It also allows us 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 with 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 or sometimes in the middle of your forehead. 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 essential; a previously unidentified conductive hearing loss is a referable condition. Even if you know that you have a conductive hearing loss and it has been assessed by an ENT, the results are still crucial for the programming of any hearing aids that may be prescribed.

This overall test will determine your hearing thresholds and would typically be the end of the audiology 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 asymmetry of thresholds is found or if you have a conductive hearing loss. Masking is essential, 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 initial 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 regular 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 essential 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 (Quick Speech In Noise) 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 what type of hearing aid technology level is most suitable for your hearing loss. For the best diagnosis and hearing aid recommendation, the Quick SIN testing protocol has become a must.

It isn’t that these tests have a direct impact on the programming of a hearing aid in the same way that the audiogram does. However, they provide a deeper understanding of your speech understanding problems and allow us to explain them, and why we are recommending a particular hearing aid or hearing aid technology.

**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 provide a professional with a clear idea about the hearing devices that will help you in noise. It will also give a clear indication that you might need assistive devices to get the best possible opportunity to hear. I will address that a little later in the section called “What if hearing aids aren’t enough?”

**Middle Ear Analysis**

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

These tests are not necessarily that important in the usual run of the mill hearing loss; they only become relevant 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 either the hearing aid that is fitted or the programming of that hearing aid, the audiometric results will. There are two parts to the Middle Ear Assessment: Tympanometry and Acoustic Reflexes.

**Tympanometry**

**What is 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 prevalent in children).

This test measures how well your middle ear works. Your middle ear includes your eardrum, 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 to this test.

**Acoustic Reflex Thresholds**

**What is acoustic reflex threshold testing?**
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 necessary 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 progressively louder beeps. You will not need to respond. Instead, the machine will automatically measure the response.
Distortion Product Oto-acoustic Emissions (DPOAE)

What is DPOAE testing?
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 what they have found and detail why it is having the impact it is in your life. They will also make recommendations based on their results 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 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 a loved one with you to your hearing test; firstly, undergoing any kind of medical examination or procedure can be stressful. It is always a good idea to take someone with you to a medical appointment. While caught up in the process and worrying about results, it is easy to miss other relevant information. If you have someone with you, they can help to remember what was said. It is always better to have two people so that as much information as possible is retained.
On this point, feel free to 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. We also understand it is our job to help you understand. It is also essential to have your family involved in the process.

**Hearing Loss is a Family Sport**

Hearing loss affects every member of the family, not just the person who suffers from it. Communication is a problem, often frustrations creep in. Family members may feel that the person with hearing loss is in denial or just ignoring the impact of the hearing loss. If the person with hearing loss has withdrawn from their social circle, family members may be concerned about their well-being. Hearing loss tends to have an effect on the entire family.

**Denial is Not Just a River in Egypt**

A grand old Dublin saying, "De Nile is not just a river in Egypt", usually uttered as someone shakes their head and throws their eyes to heaven. There is a lot of talk about denial in hearing loss, and there is undoubtedly an element of denial involved in many cases. However, denial is fed by a misunderstanding of how hearing loss works.

**Cultural Understanding of Hearing Loss**

Firstly, most people really don't understand how acquired hearing loss works or how it will affect someone's ability to hear. Most of our understanding of hearing loss is formed by TV, Radio and Theatre. In that world, hearing loss is not just something to laugh at, it appears to be all about raising the volume. "Speak Up, Speak UP, What Did You Say?" It is all very Monty Pythonesque.

**Hearing Loss is rarely about Pure Volume**

Run of the mill acquired hearing loss is very rarely about volume, it is nearly always about balance in sound. In fact, hearing loss that is about pure brute force volume is quite rare, and it is usually something present from, or related to, something from birth. In average, run of the mill acquired hearing loss, there is an imbalance in the ability to hear sounds. Some sounds can be heard quite well or even normally, while other sounds may not be heard at all.

**I Can Hear The Voice!**
Quite often, someone with hearing loss can hear someone's voice very clearly; they just can't really understand what some of the words are. If you think about that for a minute, you can see why it is easy to believe that the problem is, in fact, the speaker, not the listener. If they can hear the voice, surely the problem is that the speaker isn't speaking clearly enough?

The actual problem is that more often than not, someone with hearing loss can't hear consonants in speech. So basically words sound indistinct and mumbled. The person isn't mumbling, you just can't hear them properly. However, you can see why it is easy to think that the problem is the speaker rather than your own. That is, in fact, why people take so long to realise they are having problems. It is also why they are reluctant to release the idea that it isn't them, it's everyone else.

**Helping You Make a Realisation**

When family members attend a hearing test, they will often help their loved one towards a realisation about their hearing ability. It is the family who really understands the effect of hearing loss on the person who has it. They see and understand when there are problems, more transparently than the person who is suffering them. Don't forget, as a person with hearing loss, you don't miss what you have missed. Or to put it another way, you don't know what you don't hear.

People around you do. While you may be unsure about the depth of the problems you are having, the people around you tend to see them clearly. I have often witnessed a Patient come to a clear realisation of their issues solely through the testament of a family member. Quite often, it is the first time that the discussion about their hearing loss is undertaken in a clear and focused manner.

More often than not, it also leads to the sharing of worries that have been unsaid. Concern that has often been unvoiced.

**Keeping You Honest**

The other thing that a family member will often do is to keep you honest. I have spoken here and on the Hearing Aid Know site about not fooling yourself. As I said, family members tend to see what is really happening and generally aren't afraid to give you the unvarnished truth.

Nor are they afraid to speak up when you are lying to yourself. They have a way of telling you how it is. I find the reaction to hearing loss a bizarre thing; it seems to be one of the few health issues that are surrounded by personal stigma.

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*Hearing loss is not a statement about you, it just is!*
People will outright lie to themselves about their ability to hear to protect themselves from the thoughts in their heads! It never fails to surprise me, I have said it before, and I have no doubt I will repeat it, hearing loss is not a statement about you, it just is.

**Helping Them Understand**
Your family doesn't really understand hearing loss any more than you do. Attending the appointment will also allow them to understand the issues. It will also enable them to become familiar with your hearing loss and the effects it has on your ability to communicate. The hearing test will make it very clear to them precisely what the issues are and why you have the problems you do.

**Moving Forward**
If you move forward with hearing aids, the involvement of your family with your ongoing rehabilitation plan is essential. They need to understand the advantages and limitations of the hearing aids you have chosen. They also need to know how they can help you, especially during the early stages of rehabilitation.

**A Better Understanding of Progress**
As you move forward with hearing aids, family members can also help to assess your progress. They can also help identify areas where you are still having issues with your hearing. I love when family members are involved in the process; they are a secondary source of information which allows a full picture of what is going on. They are also a validation of the problems. Let me explain that.

When someone has an issue hearing, they automatically think it is their hearing loss and the fault of the hearing aids. Sometimes, it isn't. There have been times where a Patient has spoken about problems with a particular situation or a specific person. The family member has chimed in and said, I hadn't a clue what they were saying either! Or I couldn't really make it out with all the noise going on either. In essence, if they can't hear, neither should the Patient be able to.

In contrast to that, some Patients may think they are doing pretty well in some situations and the family member may be able to point out where there are some deficiencies. All in all, the inclusion of the family in the process has to be seen as a good thing for both the Patient and for them. So get your family involved early.
Understanding Hearing Loss

So the test is finished, and the hearing care professional is explaining your hearing loss while pointing at a fancy graph, using words like low-frequency and high-frequency, sensorineural and bi-lateral. What the hell does that gobbledy gook actually mean? Let’s talk about hearing loss, reading an audiogram, the types of loss and the effects.

Hearing loss can be caused by many different causes, a few of which can be successfully treated with medicine or surgery, depending on the disease process. Most forms of hearing loss cannot be treated other than with hearing aids. Up to recently, professionals generally discussed three types of hearing loss. However, in the recent past a new type of hearing impairment has gained recognition. Auditory processing disorder is not your typical hearing loss, however, the problems caused by the condition definitely fit within the symptoms of typical hearing loss. Let’s talk about types of hearing loss.

Conductive Hearing Loss

A conductive loss is caused by diseases or obstructions in the outer or middle ear that usually affect all frequencies of hearing. Some conductive hearing losses are temporary, some are chronic or long term. Conductive loss can often be medically treated sometimes with surgery, temporary conductive losses (usually caused by mid-ear infections) are often treated with medication. For a conductive hearing loss of a more chronic nature, a hearing aid is generally a fantastic solution delivering real benefit.

What can cause a conductive hearing loss?
A conductive hearing loss is caused by anything that interferes with the transmission of sound from the outer to the inner ear. That could be a malformation of the outer ear, ear canal, or middle ear structures, or a perforated eardrum all of which will cause a conductive hearing loss (this may be corrected surgically).

Fluid buildup in the middle ear caused by colds or upper respiratory tract infections will cause a temporary hearing loss (temporary, should pass with the condition that caused it).

Ear infection formally called otitis media, (an infection of the middle ear that causes an accumulation of fluid) will interfere with the movement of the eardrum and ossicles
so the causes of a conductive hearing loss can be classified as:

- Middle ear infections (otitis media).
- Collection of fluid in the middle ear (“glue ear” in children).
- Blockage of the outer ear, most commonly by wax.
- Otosclerosis, a condition in which the ossicles of the middle ear harden and become less mobile.
- Damage to the ossicles, for example by a serious infection or head injury.
- Cholesteatoma (growth usually in the attic of the middle ear)
- Perforated (pierced) eardrum, which can be caused by an untreated ear infection, head injury or a blow to the ear, or from poking something in your ear.

Sensorineural Hearing Loss

A sensorineural loss results from some damage to the inner ear (cochlea). Sometimes referred to as a nerve-related hearing loss or nerve deafness. The loss can range from mild to profound and often affects certain frequencies more than others. The only treatment for sensorineural hearing loss at present is hearing aids.

What is the cause of sensorineural hearing loss?

A sensorineural hearing loss is due to damage to the pathway that sound impulses take from the hair cells of the inner ear to the auditory nerve and the brain. So sensorineural hearing loss happens when there is damage to the structures of the inner ear (cochlea), it can be caused by age, disease, noise or genetic causes.

Or damage to the nerve that runs from the inner ear to the brain (auditory nerve), can be caused by disease, tumour or genetic causes. Or finally, damage to the auditory centre of the brain, varying causes such as disease or stroke. Generally speaking, the causes of sensorineural hearing loss tend to be the following:

- Age-related hearing loss (presbyacusis). This is the natural decline in hearing that many people experience as they get older. It’s partly due to the loss of hair cells in the cochlea.
- Acoustic trauma (injury caused by loud noise) can damage hair cells.
- Certain viral or bacterial infections such as mumps or meningitis can lead to loss of hair cells or other damage to the auditory nerve.
- Ménière’s disease, which causes dizziness, tinnitus, and hearing loss.
- Certain drugs, such as some powerful antibiotics, can cause permanent hearing loss. At high doses, aspirin is thought to cause temporary tinnitus – a persistent ringing in the ears. The antimalarial drug quinine can also cause tinnitus, but it’s not thought to cause permanent damage.
• Acoustic neuroma. This is a benign (non-cancerous) tumour affecting the auditory nerve. It needs to be observed and is sometimes treated with surgery.
• Other neurological (affecting the brain or nervous system) conditions such as multiple sclerosis, stroke, or a brain tumour.

**Mixed Hearing Loss**
A mixed loss is as it sounds a mix of both conductive and sensorineural hearing losses that occur in both the inner and outer or middle ear. A mixed hearing loss tends to be pretty rare.

**What are the causes of Mixed Hearing Loss?**
Mixed hearing loss is caused by a combination of conductive damage in the outer or middle ear and sensorineural damage in the inner ear (cochlea) or nerve of hearing. The causes for both are exactly the same as they are in isolation, so for the conductive loss, it can be middle ear issues, eardrum issues or even an outer ear problem. For the sensorineural problem, it can be genetics, noise exposure or disease.

**Auditory Processing Disorder**
Auditory Processing Disorder or APD is a catch-all term for hearing difficulties caused by central processing disorders. In most cases, a person may have a completely normal audiogram, but their ability to hear speech in noise is compromised. For this reason, the wider media have dubbed it Hidden Hearing Loss.

**What Causes APD?**
We really don't know, there have been many theories such as acquired injury to the processing centres of the brain at birth, genetic issues that cause processing problems or developmental in that something may occur that compromises hearing during an especially important time of development in the auditory processing area of the brain.

For instance, there has been considerable interest in chronic otitis media in children and its effect on auditory processing during an especially important time of learning and speech development.
The Audiogram

The audiogram is the name of the graph that professionals use to plot your hearing test results on. You can see an image below which is taken from our audiogram tool on Hearing Aid Know.

Frequencies or Pitch

On the top of the audiogram you will see the pitch in Hertz marked with the numbers 125, 250, 500 etc. below it. These represent different sound frequencies. In fact, they represent the sound frequencies that are most important for speech. The 1000 Hz line is the midpoint with everything below it being low-frequency and everything above it being high frequency. That’s not exactly true, but it will do for this explanation.

What Does it Mean For Speech

Low-frequency sounds in speech are the vowel sounds in words. They are the power of speech. High-frequency sounds are the consonant sounds in speech. The consonant sounds in speech help form the words, they give them the context needed to be understood. A person with a general run of the mill hearing loss often has difficulty in understanding words or parts of words. This is because their high-frequency hearing is usually worse than their low-frequency hearing. As I said earlier, they can hear the voice well enough, they just aren’t sure what is being said.
When speaking, the voice may be audible, but separate words may sound mixed up or blurred together. Rhyming or words that are similar such as cat/cap, bread/thread, pool/cool, etc. are extremely difficult to distinguish when the listener has a hearing loss. More often than not, this is because the person with hearing loss is not hearing the consonant sounds very well, if at all.

The issues caused by high-frequency loss are often compounded by the fact that low-frequency hearing is better or normal in some cases. That is because all background noise is low-frequency. The ability to hear it well, helps to mask the high-frequency cues even more.

**Volume or Intensity**
To the left-hand side of the graph, you see the numbers -10 all the way to 120. These denote the level of intensity or volume of a given sound. The audiogram uses dB HL (dB Hearing Loss). You will note a thick black line across the audiogram at 0, this line represents normal.

However, everyone’s normal is different, and for the purpose of the testing hearing, anything between -10 and 25 is normal. In terms of speech, 40 to 45 dB is soft speech, 65 dB is normal conversational speech, and finally, 80 to 85 dB is loud speech. If

**Severity of Loss**
To the right-hand side of the audiogram, you will see areas denoted with the severity of hearing loss. Which run from mild through to profound.

**Audiogram Markings**
As we test your hearing, we mark the audiogram with the lowest level of sound you can hear frequency, by frequency and ear by ear. When we are finished, the audiogram shows us the shape of your hearing loss and the severity.

The markings used are generally, red Os for the right ear for air conduction results (through the headphones). Blue Xs for the left ear for air conduction results. Green triangles for bone conduction results. If masking has been undertaken, black symbols such as these ], [ will be seen.

If the bone conduction results are close to or on top of the air conduction results. Then the hearing loss is sensorineural (inner ear damage). If the bone conduction results are better than the air conduction results, well then there is some sort of conductive hearing loss (middle ear issue).
Hearing Loss Descriptions

The descriptions for hearing loss that we use are based on the shape of the audiogram, the severity of the loss and the type of hearing loss. For instance, we would use descriptions such as sloping mild to moderate sensorineural hearing loss, or moderate high-frequency or flat severe hearing conductive hearing loss. We use those terms both quantify the loss and help you to understand the results.
The Hearing Aids

If a set of hearing instruments is recommended to you, don’t be afraid to ask the professional to write the details down for you if you wish to research them. As I said, some companies may offer white label instruments, these are instruments that are re-named by the manufacturers specifically for the company you are dealing with. If you are being offered something like that, ask what the device is precisely based on and from what manufacturer.

Don't be nervous about asking questions; ask about the different kinds of hearing aid available which are suitable for your type of hearing loss. Ask why the particular hearing aids have been recommended. As I said, a professional will not be put off by any questions. Don't be afraid to say that you would like to research the hearing aids that have been recommended to you.

On Hearing Aid Know, we try to offer a decent high-level view of most hearing aids to give a good understanding of what they will do for you. My friend Abram Bailey runs a website called Hearing Tracker, it can be found at

www.hearingtracker.com

The site offers rundowns of both hearing providers and hearing aids in the US; it also has consumer reviews of both. It is also a pretty good place to get an idea about the effectiveness of both the hearing aids and the providers who are listed.

Personally speaking, we think that Hearing Aid Know and Hearing Tracker are the very best consumer advice websites for hearing aids. Because they are both independent, tell it like it is websites. Of course, ours is the best one, hahaha.

Hearing Aids, Have Realistic Expectations

You need to have realistic expectations of the hearing aid technology you buy and what it can deliver for you. Modern hearing aids are exceptional pieces of technology, but they are not, nor probably will never be, a replacement for normal hearing.

The higher the technology levels of the hearing aid, the better the results for you. Keep this clearly in mind when you are making any purchase decision. Don't buy low technology hearing aids and expect them to help you in all situations, they simply won't.
**Knowing What You Want Helps**

Before you decide what to buy, have a clear idea of what you want from your hearing aids. Think carefully about your problem situations, consider where solving those problems are essential for you. If you keep that clear, you can consider what type of technology level will be best for you.

If you have a sedentary lifestyle and all you want hearing aids for, is listening to TV and Radio, some light conversation and the occasional journey to the shop. Low-end technology should almost certainly meet all your needs.

However, if you have a busier lifestyle and your hearing aids will be imperative for more complex sound situations, then higher levels of technology are most certainly for you. Key to any decision is the understanding of your needs and realistic expectations of the technology level of hearing aids that you will buy.

With this in mind, you will know what you can expect from what you can afford. When this is clear to you, it will make your journey with your hearing aids less stressful for you. It is the Dispenser's job to make this clear to you and they often will, however, you actually need to listen.

It isn't a sales technique, they aren't trying to up-sell you, and more often than not, they are merely giving the best advice possible. It is up to you to decide what you get within your budget, just be clear about what that will deliver to you.

**Wireless Accessories**

In recent years most hearing aid manufacturers have moved towards wireless communication within their hearing aids. This connectivity has opened up new options and resulted in new accessory devices that deliver real benefits for hearing aid users. Many additional extras can now be purchased with your hearing aids. These are all useful add-ons which can help someone with hearing loss to lead the life that they are used to.

I really think that these devices are outstanding, however, as with many things; they are only useful if you actually are going to use them. Each manufacturer will offer some wireless solution, the question is, do you need them? These can increase the costs, so think carefully before buying. Don't pay for something which you might not use very often or pay for something you don't really need.
However, having said that, if you are constrained by your budget, and you can’t go for the technology level of hearing aids you would like. An accessory can help to make up for what you are missing. For instance, a wireless remote microphone can really deliver fantastic results for hearing in noise even when paired with a low technology hearing aid. Keep this in mind when you are making the buying decision.

**Be Sure Of What Are You Buying**

So you have made the decision to buy, you have picked out the aids and the accessory you want. You need to be sure about what you are actually buying. Ask the seller to explain in detail what you are actually buying, if they say lifetime aftercare, ask precisely what does that mean?

The life of the hearing aid, a set period, your lifetime? What does that aftercare include, are there structured callbacks, will you drop back when you have a problem, or alternatively will they just call you for a re-test in five years?

These are all things that you really need to know, I have said it before, hearing aids are sophisticated devices that need care and attention to deliver to their best ability. Hearing problems are not like vision problems, hearing aids are not like glasses, you don't put them on, and everything will be fine.

You need support and rehabilitation, and that support needs to be ongoing. So it is crucial that you clearly understand what you are buying when you pay your money. What aftercare and help will you get?

**General Considerations**

When choosing the size and shape of an aid, an important consideration is your dexterity. You may find that smaller hearing aids are difficult for you to handle and insert. Not just that, the battery that powers it, may be too small for you to handle, if your eyesight is not great, you may also have issues with the size of the aid or the battery.

Always remember, you are a customer as well as a Patient, and if you feel that you want to try something different or go away and think about it, then do so. I have mentioned aftercare already, but it is imperative that you understand what you are buying.
Find out about aftercare and warranty servicing of your hearing aids. They are an expensive investment, and you should always check exactly what is included in the warranty and aftercare service.

**Make Sure You Have a Written Agreement**

Finally, make sure you have a written agreement, then you always have a reference to the agreement you have made. I sincerely hope that this advice will allow you to make educated hearing healthcare decisions. Find a company that you feel comfortable with, ask them lots of questions about the hearing aids that they offer, what they think would be best for you and what exactly is their service offering and you should never go wrong.

Better Hearing, an organisation in the States, offers an excellent rundown on buying hearing aids. It can be found here:

What If Hearing Aids Are Not Enough?
Unfortunately, for some people hearing aids will never be enough to help them understand in every situation. No matter what level of hearing aid technology they buy, they will still have problems, sometimes even in moderately noisy situations.

To understand this issue, we need first to discuss speech discrimination, and why people may have these problems. We can then explore strategies that may help.

Why Would Hearing Aids Not Help?
There are two reasons why a set of hearing aids might not help you in certain situations, the first reason is that the level of technology you have bought was never designed to help you in that noisy environment. The second reason is much deeper than that, and it involves what is going on in your mechanism of hearing and possibly your auditory cortex. Unfortunately, sometimes no matter what we do with the technology, your ability to understand speech in noisy situations may still be problematic.

Hearing aid technology has moved on so much that it is easy for us as professionals to lose sight of the fact that for some people, they won't work everywhere. I mean I get excited about hearing aid technology as it evolves, and I really see the treatment benefits that the evolution of technology brings.

However, I need to remember that the revolution in hearing aid technology delivers significant benefits to most of the people who need it, not all. In a general run of the mill hearing loss, a good set of hearing aids will work exceptionally well. Depending on the level of technology purchased, they will work well almost everywhere.

However, if you suffer from a hearing loss, which is further compounded by a speech discrimination issue, well then even the most exceptional hearing aids may not be enough for you. Let's talk about speech discrimination and why it matters to the outcomes that you will experience with hearing aids.

Speech Discrimination Score
We measure your ability to hear sounds, and that allows us to understand your hearing loss and the softest sound that you can hear. However, it doesn't give us an indication of
your ability to understand or process speech. So that we know your speech discrimination, we measure how well you can understand what you hear when speech is loud enough to hear comfortably.

We measure speech discrimination in per cent terms, so if your discrimination scores are 100%, you understand every word that you hear. However, if your speech discrimination is 0%, you can’t understand a single word that is spoken, no matter how loud it is. It isn't very often that we see 0% scores from anybody with a regular, general run of the mill loss.

While hearing loss is a function of damage to your hearing mechanism (outer ear, middle ear and inner ear). Speech discrimination difficulties may not be. We believe that speech discrimination issues can be caused by damage to the outer and inner hair cells in the inner ear. However, there may be central auditory issues at play as well. In essence, the brain may not be sorting out the information as it should.

Generally, speech discrimination problems and hearing loss go hand in hand. However, even somebody with a severe hearing loss may have speech discrimination of 70 or 80%. Which at its basic level means that they understand four out of every five words if presented at the right volume.

**Hearing loss levels are not a good indication of speech discrimination.** Two people may have the same hearing loss (unlikely but you know an example right) but have two completely different speech discrimination scores. The key to me blathering on here is this if you have a hearing loss and your discrimination is good (80% or higher), typically you will find hearing aids will work pretty damn well for you in most sound environments.

However, if your discrimination is poor, well then hearing aids will not deliver everything that you need to hear better in complex situations (noisy ones). The more complex the situation, the more difficulty you will have. While wearing top of the range hearing aids will give you a little boost, they will still not deliver everything that you need. So what is the answer to an infuriating problem?

**Assistive Listening Devices**

If your ability to discriminate speech dives in noisier situations, even when wearing a set of hearing aids, well then you need strategies to help give you an edge. While there are coping mechanisms that may help. The one thing that should dramatically improve
things, or at least provide enough help for you to work out what is going on is some sort of assistive listening device.

Every hearing aid brand now offers a range of assistive listening products. Some are specific to one situation or need, while some of the latest ones are really multi-functional offering different functionalities in one device. I want to just focus on one device right now because I want to give you an example of how a device can change your life for the better.

The Multi Mic

The Multi Mic device from Resound is both a remote microphone (for a partner to wear) and an intelligent desktop microphone (place it on a table, and it helps pick up a group conversation). However, Resound was not happy with just that, and they also included a line in (attach any audio source to the mic with a cable) and a telecoil receiver (connect wirelessly to loop systems). So you can see when I say multi-functional I mean it.

Of course, the Multi Mic only works with Resound hearing aids. If you are in a noisy situation with just one person, they can wear the multi-mic, and you will hear their voice clearly directly in your hearing aids. If you are in a noisy situation and you are with a small group, you can lay the multi-mic down on the table in front of you, and it will help pick up the voices of your companions and stream them directly into your hearing aids.

The device is intelligent, knows it is laying on a table and changes how its microphones work to catch the voices of the group better. In this way, the device helps to deliver the best and cleanest signal to your ears, giving you the optimum opportunity to work out what is being said. The telecoil addition is inspired, all public buildings in Ireland and the UK have loop systems, nearly all churches have one, most banks, post offices, theatres, concert halls and cinemas. The loop wirelessly transmits relevant audio and the telecoil picks up that transmission and streams it directly to your hearing aids.

Loop systems are becoming much more common in the US through stalwart work of activists and the Hearing Loss Association of America.

The inclusion of a telecoil receiver means that you can wear a discreet pair of hearing aids with no in-built telecoil, but still have access to what is an excellent system through the multi-mic. The line in speaks for itself, you plug your audio from the television or your music player, and it is streamed directly to your hearing aids. The functionality of these types of devices gives you the best chance to hear enough to work out what is going on.
**Personal Experience With Connect Clip**

I have had some personal experience with remote mics, I first used the Soundclip-A from Bernafon, and I was blown away. I then used the Connect Clip from Oticon and again was really impressed with the functionality (in essence, they are the same device).

Recently, I got a hold of a Resound Multi-Mic, and with my limited use of it have been thoroughly impressed. If you have speech discrimination issues that are particularly exacerbated by noise, well then this type of technology should be a given for you.

**Aren’t Telecoils Obsolete?**

Hell No! Why You Should Always Consider a Telecoil. I read with horror recently that a prospective patient was told that hearing loops and hearing aid telecoils were obsolete technology now replaced by Bluetooth. That is not true, while telecoils and loop systems are old technology, both systems are just as relevant today to prospective hearing aid users as ever.

Even with the ever-growing Bluetooth hearing aid market, a telecoil is still a valid feature and will remain so for many years to come. Modern hearing aids are built with both Bluetooth and telecoils for a reason. Let’s talk about why you should always consider a telecoil in your hearing aids.

**A Looping Resurgence**

In the UK, Ireland and most countries in Europe, loop systems are everywhere. In every public building including concert halls, churches, theatres, airports, Taxis, shops and government buildings. Mainly because of the EU's insistence on accessibility for everybody (damn EU making it easy for everyone to be included!).

While that isn't the case in the US, loop systems are seeing a huge resurgence over there because of committed campaigners and the Hearing Loss Association of America. More and more loop systems are coming online in the US in public places.

It’s straightforward, telecoils allow you to connect easily to loop systems. Loop systems provide direct wireless audio input into your hearing aids. No interference, no background noise, just the signal directly from the input, whether that is the microphone a priest is using, the audio system in a theatre, the microphone the cashier is speaking into at the bank or the music from the concert hall stage.
The system gives you the very best access to the sound you want to hear. So no, telecoils are not obsolete, they may be old, but they work just fine, and there is absolutely no sign of a better solution on the horizon. In fact, if anything, loop systems are becoming more popular in the US, so you will get to use your telecoil in more places than ever moving forward.
Fitting the Hearing Aids

So we have covered the hearing test and making your decision about buying hearing aids. Let's talk about the initial fit of the hearing aids and the aftercare. Firstly let’s look at the actual fitting of your new hearing aid devices, what do you need to consider and what information should be given to you?

The Fitting

The fitting itself is a relatively short exercise; the professional will place the hearing aids on and programme them to your hearing loss. We would undertake some tests concerning how you are hearing and verify that they are delivering against the targets that have been set. The initial prescription level we set will often not be the optimum prescription.

This is so that the hearing aids do not overwhelm you. You will need to acclimatise to them, and this will happen over time. However, we would programme the hearing aids to automatically increase the prescription gently to move you towards the optimum prescription over a period of time. This is called automatic acclimatisation, and it is something that is done slowly, in fact, you will barely notice that the amplification is changing as you wear them.

Getting Comfortable With Your Hearing Aids

We try to ensure that you are entirely comfortable with your hearing aids. When we say comfortable, we don't just mean physically. You need to be comfortable not just wearing your hearing aids but also handling them. In relation to physical comfort, you will be wearing your hearing aids every day, all day. Initially, they will feel odd, in particular, if you are a first time user. However, that should settle down very quickly.

We will make sure that you can insert the hearing aids in, or on, your ears by yourself. We will also ensure that you can take them out with ease. It is vital that you can handle your hearing aids with ease and confidence; otherwise, they will not fulfil their purpose as solutions to deliver you a better life.
The Batteries
We will show you what batteries you need and how to put the batteries into your hearing aid. It is crucial that we assess that you can manage the batteries by yourself. We will make sure that you can both handle them and put them in by yourself.

We will also give you information on where you can buy batteries, how much they cost, and why it is a good idea to keep spare batteries handy. If your hearing aids are rechargeable, we will instruct you on the use of the charger and inserting and taking out the hearing aids from the charger.

Controls on Your Hearing Aids
If your hearing aids have any controls, we will show you how to use them and what they do. You should make sure that you can operate all of the hearing aid controls yourself, and change the listening programmes if in fact there is any. It is vital that we assess whether you have the dexterity to operate the controls for your hearing aid. If your hearing aid is supplied with a remote, we will show you how to use it.

Cleaning & Caring For Your Hearing Aids
We will show you how to clean and care for your hearing aid. Hearing aids are a big investment, taking good care of them makes real financial sense. We will talk about keeping earwax out of the sound bore and changing wax guards if your hearing aid has them. We will also talk about daily cleaning routines and why you should use a dehumidifier box as part of your care routine.

Proper care and maintenance of your hearing aid are crucial, it will ensure that it continues to help you hear better for longer. At the initial fitting, all of this will just be a quick run through; we don't want to overload you with information. We will ask you to read the owner’s manual, and at further appointments, we will ensure that we reinforce the information and that you can clean and care for the devices.

Assistive Listening and Alerting Devices
A hearing aid may not be the full answer for you, in some instances, there may be some assistive devices that make sense for you and your lifestyle. Most hearing aid manufacturers have released their own wireless devices for hearing aids.
However, there are many more available from non-hearing aid manufacturers like smoke detectors and amplified phones. We will always give you information regarding assistive listening technology such as the telecoil, mobile phone technology, how best to use phones etc.
**Real Ear Measurements**

In a conversation with Steve recently, it became evident that I hadn't up to now taken a real stand on a subject that is important to me. The issue is probe tube measurements of hearing aids. They are more commonly called Real Ear Measurements (REMs) and or Live Speech Mapping.

They are elements of hearing aid verification and validation. They are the best practice, the gold standard in hearing aid fitting. They are a proven strategy for increasing satisfaction with hearing aids and have been for many years. In fact, as a consumer advice champion, advising you of what they are, what benefit you will derive from them, and why you should demand them is really my job.

Let's talk about what they are, how they are done, and why you aren't getting the best service if a hearing care professional doesn't carry them out for you.

**Live Speech Mapping and Real Ear Measurements, Why You Need Them During Your Hearing Aid Journey**

They are forms of verification of a prescriptive target and validation of a prescriptive target. Let me explain the difference. Real Ear Measurements are designed to verify that the hearing aids in your ears are actually hitting the targets prescribed by the fitting prescriptions Nal and DSL.

Those fitting prescriptions have been with us for many years and in the clinical world, they are accepted as the very best fitting prescriptions. However, not everyone agrees that in the modern world of hearing aids, that Nal or DSL is still the best way forward. Some people, like me, think that hearing aid manufacturers often use their own fitting prescriptions because they know their hearing aids best.

With that in mind, we need a test to see if those non-standard (as such) prescriptions deliver the speech signal needed to help people. We can't use REMs to verify because all REM protocols are designed just for Nal and DSL. However, we can validate it using live speech mapping to ensure that a controlled speech signal is amplified into the residual hearing envelope of a Patient.

For me, and it is only a personal opinion, live speech mapping is the better option. That is because I am not necessarily beholden to Nal or DSL.
Why are REMs and Live Speech Mapping Important?

These tests are necessary because they verify or validate that the hearing aid is actually providing the sound that you need to hear better. The settings take your hearing loss into account and provide the calculations for the amplification required to deliver for you. When we run the tests, we are actually assessing what is going on in your ear canal.

There is no guessing, no trusting the hearing aids to just work, it is a clear assessment of whether they are delivering or not. This allows us to make real-time changes to the hearing aid settings to ensure that they do provide the amplification you need.

All of the studies undertaken into the use of verification and validation measures within hearing aid fittings show that people get on better and are more satisfied with their hearing aids when it is done.

The Possible Pitfalls

Here is the thing though, when we use these tests, we get the hearing aids to the optimal settings for your hearing loss. You actually might not like the sound, in fact, you might hate it and need it turned down. I don’t see that as a bad thing, neither should you.

The professional will explain to you that you won't get the best possible experience, but we can help you work towards it during your rehabilitation. Just because you might not like the sound, doesn't mean I shouldn't do it, and anyone who uses that excuse is talking rubbish. Utter and contemptuous rubbish.

How is it Done?

Both procedures are done in a similar manner. We use a probe tube system. The system consists of separate devices for each ear that has thin white rubber probes. There is a probe for each ear, and they look like a short straw. First, we calibrate the probe tubes by holding them in front of a speaker, which plays the calibration tones.

This doesn't have to be done every time, just after the probe tubes have been changed. However, usually, we would only use the probe tubes for one person, then throw them away. After the calibration, we would hang the system devices from your ears and place the probe tubes in your ear canals. We are trying to get them within 5mm of your eardrum.
To do so, we would typically check the positioning visually. Once that is done, we play different test signals through the speaker to assess what is happening. This can be done with no hearing aids in, with the hearing aids in and turned off and finally with the hearing aids in and turned on.

The results are shown on our computer in a simple to read visual manner. We can see clearly where the amplification is missing the targets if that is the case. Sometimes, the amplification might not be enough, sometimes and in individual ears, we may see that there may be too much amplification at one or more points.

You know what, sometimes it is bang on target. In fact, more often than not in the last few years, it is more or less bang on target. Here's the thing though, we don't and can't know that for sure. So the fact that many modern hearing aids perform in the ear as they should. Is not an excuse not to undertake the test.

Again, anyone who says it is is speaking utter rubbish. I have heard many reasons for not performing probe tube measurements on hearing aid users. They are generally all utter and contemptuous rubbish. Dr Cliff Olson AuD (a rising star in US Audiology and a strong consumer education advocate) has a couple of great videos on the subject on Youtube.

In one of those videos, he identifies and refutes each excuse. You can take a look at those excuses and his answers by searching Youtube for “DR Cliff Olson AuD: 5 WORST Excuses to NOT use Real Ear measurement”. The key really is that excuses, no matter what they are, are bullshit.

**When Should it be Done?**

The answer to that is when you are to full prescriptive level, that could be at the first fitting, or it may be later, let me explain. If you are new to hearing aids, most professionals will not fit you to your prescription level at the beginning.

You simply wouldn't be able for it. You would find it uncomfortable and loud. To manage that, we tend to fit you to a reduced level and over a varying (varying because it depends on the Patient) amount of time we would move you to the prescriptive level.

It is then that Real Ear Measurement should happen because it is then that we have reached the best possible amplification for your hearing loss. Therefore, that is the time to test the outputs in the ear. If you are an existing user of hearing aids buying a new set of hearing aids, well then we might fit you to prescription immediately. If so, well then the process should be done at the fitting.
The Best Possible Outcome

If I am committed to delivering the very best possible outcomes for my customers, I need to undertake some sort of probe tube measurement, be it REMs or Live Speech Mapping. It is only then that I can be confident that I am delivering what is needed for the best possible outcome for you. Having said that, in some cases, even after doing it, there can still be problems.

Hearing and hearing ability is unique. Sometimes people with treatable hearing losses have problems understanding speech in noise no matter what is done with their hearing aids. This is a function of an underlying problem in the hearing area of the brain, and no matter how well the hearing aids are fitted, they may struggle to help. Here's the thing though, we, and by that I mean the professional and you the user, will never know that is the case unless we have clear and irrefutable evidence that the hearing aid is performing at it's best. Undeniable proof that it is doing what it should in the ear canal of the user. The only way to gain that conclusive evidence is through probe tube measurements.

I echo Cliff Olson when he says "I find it sad that some hearing care providers feel the need to fabricate excuses as to why they don't feel the need to perform Real Ear Measurement." We have known for years that all the studies support it as a best practice. In fact, Best Practice guidelines indicate that probe tube measurements are the Gold standard for hearing aid verification and validation.

Find A Provider Who Does

It is my best advice to you, knowing what I know, after studying the studies available, and indeed through my own experience fitting hearing aids, that you need probe tube measurements as part of your hearing aid journey. It is my best advice to you to find a hearing care provider who does offer them when you are purchasing hearing aids. Ask any provider you deal with, do they provide probe tube measurements, if they say no, tell them you will go somewhere else.
The Follow-up Visit
Your first follow up visit is an important time for you and us. We want to know how you have been doing and how the hearing devices worked for you. We will ask you about your listening experiences with the devices and how you have been wearing them. You should be prepared to give us an update on how you have got on in all the different listening situations you have been in.

The questions we ask will cover how you did in noise, your perception of loudness, clarity, any discomfort, etc. Tell us everything, we really want to know, we want to know how you got on. It is worthwhile for you to keep a notebook or diary during the early period so that you can keep track of how you are getting on. This can be invaluable for us because the information is written down as it happens.

Fine Tuning
It is not unusual for fine tuning of your hearing aids to be needed, sound is a very personal sense, think of music. To one person rock is sweet music indeed, but to another, it is a racket. In the same manner, what is right for one person with hearing loss may often be wrong for others. During this time you will also become accustomed to the hearing aids, this takes some time. Again, the time it takes differs from one to the other.

It may also take some time for you to get the best out of your hearing devices. While we restore normal levels of hearing, the processing centres of the brain take some time to adjust. It takes time for your brain to sort out this new sound information. This period is called the rehabilitation period, while initial improvements happen quickly, full rehabilitation can take up to a year.

Reinforcement of Information
At this visit, we will also take the opportunity to reinforce all of the information we have already given you. We will again discuss the hearing aids and their functions and talk about your clean and care routine.
Ask Your Questions

You will probably have many questions of your own at this stage, make sure you ask them. We have given you a large amount of information during your earlier visits. If any of it is still unclear to you, ask us to go over it again. Since your fitting, you may have new questions. We try our best to cover all of the information you need to know and to make sure you understand.

However, even we forget things from time to time, so ask any questions and that you think you need an answer to. If you need it written down, ask us to do that as well.

Your ongoing aftercare from here is based on what you have paid for. I would be seeing you on a regular scheduled six-monthly basis. Those appointments would vary from thirty-minute meetings to full-on hour sessions where I would re-test your hearing.
**Telecare**
Telecare or remote care has been something that has been discussed within our profession for a long time. It offers the opportunity to reach remote Patients, offering them the care they need without travelling long distances to be present.

Traditional ideas of telecare are being explored across the world in areas where populations are dispersed, and access to hearing healthcare is spotty. However, hearing aid manufacturers have turned their attention to the concept to deliver better service to the people who wear their hearing aids.

**Introduction of Telecare by Signia**
The introduction of telecare by Signia was an exciting development. In essence, Signia introduced a system whereby your hearing professional could make limited fine-tuning changes to your hearing aids remotely through an iPhone app that was connected to your hearing aids. I liked the concept a lot, although many within the Profession were a little suspicious.

**Expansion of Telecare by Resound**
Resound went one step further with the launch of their 3D platform. They, in fact, offered complete remote fine-tuning capability to the Professional, again through an iPhone enabled app. I thought to myself, now you are talking.

**Complete Real-Time Telecare**
Signia, not to be outdone, expanded their telecare offering to offer full fine-tuning ability and incorporated the ability to make voice calls to the Professional within their telecare app. But they didn’t stop there.

**Face to Face Remote Meetings**
They have also incorporated video calling to the system, which means that Patients can now have a remote, face to face meeting with their professionals for aftercare and fine-tuning.
**Why Should You Care?**

Telecare is evolving, and nearly every major hearing aid brand is either offering it right now or will offer it shortly. Again though, it will not be something that every hearing aid user will be interested in. But I believe that as hearing aid user demographics change, so will the uptake of telecare.

**What it Will Do**

Simply put telecare will make life easier for users and professionals alike. It will mean that a hearing aid user will not have to attend the office physically to have changes made. It will also mean that Professionals can vary their follow up schedule. Perhaps including one or two remote sessions into the schedule.

Moving forward and as the technology changes and evolves, it could open up a different business model. I mean what if the hearing aid brands made remote fitting possible? That could mean that the online business model would be more effective. It could also mean a complete change to how we as Professionals work.

**Complete Remote Care**

For instance, how would you feel about a future where you bought hearing aids online and where fitted and cared for remotely by a call centre anywhere? I certainly don’t think that would be palatable for everyone, but I can imagine some would be happy with that if the price were right. Speaking of price.
Hearing Aid Pricing
In the first edition of this book, I stayed away from hearing aid pricing, mainly because it made no real sense to talk about it because it varied dramatically across the world. I still am not going to speak about individual prices here. Because I simply don't know what they are. However, I am going to try and explain in detail how my pricing is reached and why it might differ dramatically across organisations.

On Hearing Aid Know we try and include price guides for the UK, Ireland and the US. They are aggregate price guides, just giving ballpark prices that we have been able to discover. If you are interested in one particular hearing aid and its price in your country, you could have a look at Know to see if we have listed it.

This is not a defence of hearing aid pricing. I know that pricing can be a touchy subject across the consumer world. It is an explanation of how I come to my pricing. You should use it as a gauge to allow you to understand if someone else price is providing value for money.

What Goes Into The Price?
The retail cost of a hearing aid is based on similar factors across every organisation. The cost of the device to the retailer, the cost of delivering the device to you plus profit. It is a relatively simple equation or matrix. If you were to judge the price of hearing aids at a retail level against the cost at the wholesale level, you would consider the difference extortionate.

However, it isn't a simple mark up equation, you aren't just buying a product. You are purchasing a product and a level of service which includes multiple visits. That service is supplied by a professional who sets a price on his or her time and experience. I am one of those professionals; I think my time, knowledge and knack for making hearing aids dance is worth money.

Let's Break Down the Price
Cost of devices (varies by technology level obviously and by any agreed discount levels)

The hearing test itself which is at least one hour (in the UK and Ireland this is often free, but if you buy the hearing aids it is kind of bundled into the price)

The fitting of the hearing aids, an appointment which usually takes at least forty-five minutes if not more.
Initial follow up visits, I like to do at least two during the first month. If at the second follow up visit, I am not happy with the progress, I will schedule at least one more for two weeks later.

Ongoing service calls, there is some debate about how often this should happen, many feel calling you back once a year is enough, I generally like to see my customers every six months. Some people would call that overkill, but I like to do it. For some Patients, a six-month visit is imperative, for others, twelve monthly visits would probably be fine.

The issue for me is that I don’t know which is which until I have some experience with them. Undertaking six monthly appointments makes me feel comfortable that I am heading off any problems before they really happen. These ongoing callbacks will continue until the hearing aids die, which will be for at least eight to ten years probably.

Occasional drop-in visits, Geoff they stopped working, you forgot to change your wax guards, oh yes sorry about that, how are the kids? Happens all the time, sometimes it isn’t just wax guards.

This is Not Justification

I am not trying to justify prices here; I am merely trying to explain what goes into my assessment of the price I charge. I personally will probably spend at least twenty hours with a customer during the lifetime of a hearing aid, and I think my time and expertise is worth money. It is as simple as that.

I also have business expenses to cover, light, heat, a receptionist, equipment costs rent and rates etc... These things all affect the price I set for hearing aids. Is my retail price the same as others? Maybe, maybe not, however, I feel that the price I charge is commensurate with the level of care, attention and experience I provide.

The key here is that I have carefully made you aware of what I provide for the price I will charge. So you are very clear about what you are getting for the price I charge. What you need to understand is that what I offer may not be replicated by another provider. That is your job to both understand and assess.

Will a corporate business or another independent dispenser supply you with the same level of care and attention? Will their Dispenser have the same professional experience and expertise? If the answer is yes, well then you are assessing like for like.

There has been much talk about the greed of professionals, in particular in the United States. I can’t comment on it because again, I don’t know what the prices are or what
the price includes. I also don't know what a professional considers is a good hourly rate over there.

If you are in the United States and looking for hearing aids, I think you can probably make a better assessment of that. The key learning I want to pass to you here is to understand what the price you pay includes, because if you understand that implicitly, you will be able to make an educated assessment of the benefit to cost ratio.

The last thing I will say is that just because it is cheaper, doesn't mean it is the same. Always understand the broader picture and be sure of precisely what you are getting for the price you are paying. Always, always, get it in writing.

**Changing Prices Internationally**

Hearing aid prices have been changing globally over the last few years. There is downward pressure on prices across the world that is mainly driven by low price sellers. In essence, many of these are internet based sellers that actually have no staff. What they do is generate leads that they pass onto private practices.

The private practice is then forced to either sell the devices that you are interested in at the price dictated or they switch sell you to something else. Many national businesses have also reduced their pricing based on the model that they are delivering. For instance, some in the UK and Ireland probably have some of the lowest pricing available.

That pricing is realised through their business model, which in essence is a conveyor belt. Get them in, get them fitted, and see them when you can. I don't agree with that business model, but hey, it works for them, and there are plenty of people who buy from them. Do those people buy from them a second time? Of that, I am not sure, but I regularly have their customers come to me for help. I generally tell them to go back and demand help, which is what they paid for.

Experienced users of hearing aids tend not to base their buying decisions on price, although of course, price is a factor. Experienced users are focused on service and care, while new users with little experience focus solely on price. This fact and the pricing of others has led to reducing hearing aid prices overall.
A good thing and a bad thing

For the consumer, this has to be seen as a good thing, right? Well yes and maybe no, but let me explain. There was definitely room to reduce prices; however, I think that providers also need to be careful. If we reduce our rates so much that it makes no financial sense. The consumer is the one that will suffer. I said it earlier, just because it walks like a duck, quacks like a duck, doesn't mean it is the same duck!

It is a simple equation if my price does not cover service, I either don't give it, or I go out of business. It really is as simple as that. I think the death of Independent hearing healthcare providers would be a terrible thing for the consumer generally. Independents really do tend to act as checks and balances on the system.

So, how can I address the downward pressure on prices but also make sure that the prices I charge make financial sense for my business and the consumers I serve? Because as a business person, it really is up to me to meet the consumer demands.

Unbundled pricing

For many years there has been some debate within the profession about unbundling the pricing. By that, I mean clearly setting out the price of the hearing aid and the price portion of the service and care. While some, particularly in the states, have gone down that route it is by no means widespread. I think it is a great idea because it implicitly informs a consumer what they are buying.

It could also open up the pricing arrangements; for instance, say you didn't think that you would need any more than one check-up a year because you are a confident, experienced user. I think I should be willing to deduct the costs of the extra check-up and set a price with you for any incidental appointments that arose.

There are some problems with using a system like this in the UK and Ireland because of the V.A.T. implications. It would mean hearing health providers who went down that route would have to begin to charge value-added tax for the services they implicitly provide. It is something that we would have to consider.

For me, I think that is a winner for both of us, you get a deduction, and I am still covered for my time. I don't know how others in the industry feel about that, and I am not sure how you feel about that, but I think it is something worth exploring. That is my personal opinion folks, for what it is worth, I don't know how others within the business feel.
Hearing Aid Manufacturers
There are many different hearing aid brands across the world, in particular in the US. There is also a host of new players becoming involved globally. However, the hearing aid space is dominated by the big six. They are the most prominent players in manufacturing globally and have the most significant market shares. Or at least it was.

The big six was made up of Widex, Starkey, Sivantos/Signia (formerly Siemens), GN Resound, Sonova (who own Phonak and Unitron, and finally William Demant (who own Oticon and Bernafon). However, Sivantos/Signia and Widex have merged to form WS Audiology. So we are left with the big five.

These manufacturers are the ones who dominate the global market, and they do so for a good reason. They offer some of the best hearing aids available today. Take it as read, if the hearing aids provided are not by the brands I have mentioned, they are also-rans or second brands.

In the next few pages, I would like to try and give you a high-level overview of who they are and what they offer. I will not cover them all though, I will explain a few. I will continue to separate Widex and Signia, because those brands will continue separately for many years to come.
**Oticon**

**Danish Manufacturer, Talk About Brain Hearing**
Oticon is a Danish hearing aid manufacturer; they are owned by one of the biggest corporations in hearing care called Demant. Oticon has been around for a very long time, and they are one of the biggest hearing aid brands globally.

In the past, their hearing aids have not been that great in fairness. However, a couple of years ago they began to move ahead. Initially, they began to speak about Brain Hearing and how their hearing aids were designed to work with the brain. I could never really work out what that meant.

Anyway, shortly after, they introduced the Opn, that is when I got interested. The Opn is an astonishing hearing aid platform. Oticon launched a whole new way to handle directionality and therefore, process sound for the user.

I have used the Oticon Opn, and I have been very impressed, it is different from any other hearing aid that I have ever worn. The real difference is when you are in noisier situations, the difference between the Opn and other hearing aids is profound but subtle.

With standard hearings aids, the noise in a noisy situation is like a wall. Basically a wall of sound with no nuance. You can hear the voices you need to, but the noise is in the background is like a wall. With the Opn, it is very different; there is a real nuance to the noise.

It seems that the user gets a more normalised sound picture. While this seems to be the case, it does not interfere with speech intelligibility. Generally, the conversation is effortless, and when people call you to get your attention, it seems easier to hear them.

Oticon says that this new strategy will deliver a more normalised sound picture to the brain and therefore tap into the brain's abilities to hear well in noise.

**Oticon Hearing Aids**
Oticon’s latest hearing aid platform is the Opn S, but before I talk about it, I want to talk about some legacy stuff. It will become clear why, as we go.
In the past, Oticon used a somewhat confusing way to name their hearing aids, giving each level of technology a different name that covered a range of hearing aid types. For instance, the Ria, The Alta etc. They also offered six different levels of technology, two at each tech level. That meant the Ria and the Ria Pro were both entry-level hearing aids, but the Ria Pro was a bit more featured.

The introduction of the Opn range changed that though, the Opn was introduced in three levels of technology which use numbers to designate the level. The flagship device range was the Opn 1, the mid-level device range was the Opn 2, and the entry level was the Opn 3.

While initially, the Opn was only available in behind the ear and receiver in canal devices. Oticon introduced Opn custom hearing aids in 2018. The custom hearing aids were Made For iPhone enabled, but only down to the In The Canal model, which is slightly larger than a CIC.

As I said, Oticon introduced the new Opn S in 2019, again, it was introduced in three levels of technology, the 1, 2 and 3 and only with the behind the ear and receiver in canal models. For the first time, they have also introduced a lithium-ion powered rechargeable receiver in canal device.

Technology levels are always something that confuses prospective buyers, in essence, each technology level offers the ability to hear clearly in different situations. The premium range offers the best support in every sound situation you will find yourself in. The entry level will provide much less support.

That isn't necessarily a bad thing; maybe you don't need the support! A good analogy is a Sat-Nav on a car; you can have a shiny new car with a pretty and sexy Sat-Nav. However, if you only go to the local shops, it is neither much use to you or worth paying for.

Hearing aid technologies are similar in concept, if you aren't very active socially, why would you want to pay for a level of technology that offers you the best support for hearing in complex sound situations? It is a lovely thing to have, but if you have no need for it, why bother or be worried about it?

I explain technology levels later in the book; however, I just think it is worthwhile making a comment here in our first introduction to manufacturers.
The Platform
As you have probably guessed by now, Oticon's latest platform is called the Opn S. The platform uses the Velox S chipset which they say offers a new level of processing power providing faster automatics, new highly sensitive detectors, and increased memory. They say the new chipset is powerful enough to analyse 56,000 additional times per second than the original Opn.

That translates to increased performance across both updated and new features. The OpenSound Navigator, which is responsible for that unique way of processing sound works better than before. The new OpenSound Booster function in the accompanying app offers even more help in everyday noisy situations to those who need it most when they need it.

The new OpenSound Optimizer prevents feedback. It allows the aids to deliver the optimal gain, providing more open fittings with no feedback.

A personal note on the OpenSound Navigator
Oticon introduced this entirely new way to handle sound inputs that is altogether different from any microphone strategy that has gone before. Without boring you with technical details, this feature allows you better access to sound from all around you while ensuring that you can still hear the conversation that you want to.

Both Steve and I have found this feature to be both very good and dramatically different from anything that we have tried before. Up until now, modern hearing aids have used a directionality method of attempting to pinpoint whom you want to listen to in a noisy place. You could have your hearing aids set to focus straight in front of you, or you could widen that focus a bit to encompass more sounds, but it was really about narrowing the areas down you wanted to hear from and blocking out noise from elsewhere.

When using this type of strategy, the perception of the user was that they had a wall of noise behind them. They could hear the conversation they wanted to, but everything else was just that wall of sound. As I said, the new strategy gives a much more nuanced and normal sound picture.

For instance, when I wore them in a noisy situation, I could hear people having conversations behind or to the rear side. I didn't know what they were saying, and I didn't need to, but I knew it was conversations.
Opn S Hearing Aid Prices

We would expect the Oticon Opn S range to be sold at prices from £1200.00 to £2200.00 in the UK depending on the Practice and location. We would expect the range to be sold at prices from €1400.00 to €3000.00 in Ireland. We would expect the range to be sold at prices from $1500.00 to $3200.00 in the USA.

Opn S Hearing Aids

The Opn S is Made For iPhone enabled, and while the range is currently limited. I think Oticon will introduce custom Opn S hearing aids in late 2019 or early 2020. We don’t have any details on that, but if you occasionally take a look at the Hearing Aid Know website, we will announce the introduction and explore the details when it happens.
**Opn S miniRITE**

The Opn S miniRITE hearing aid model is a very discrete wireless slimline 'Mini-Receiver-In-Ear (miniRITE)' hearing aid using a 312 battery. Powerful fully featured and offering amazing discretion.
**Opn S miniRITE-R**
The Opn S miniRITE-R is a wireless slimline Rechargeable 'Mini-Receiver-In-Ear (miniRITE)' hearing aid using a new lithium-ion rechargeable battery which offers 16 hours of use with five hours of streaming. The battery pack is easily replaceable in the clinic. The device also has a telecoil.
Opn S miniRITE-T
The sleek and discreet wireless MiniRITE-T features a telecoil and double pushbutton for easy volume and program control. It is powered by a 312 battery.
Opn S BTE13 PP
The powerful and compact BTE13 PP fits hearing losses up to 105 dB SPL to benefit people with severe-to-profound hearing loss. The plus power solution features a telecoil, a tactile double pushbutton for easy volume and program control and a two-colour LED indicator to monitor hearing aid status for both users and caregivers.
**Widex**
Widex is a Danish Brand who has been around since the fifties. They were founded by two men who had left William Demant (Makers of Oticon and others), and they first manufactured out of a garage. Since that beginning, Widex has become famous for technical excellence and absolutely fantastic sound quality.

Widex has always followed its own agenda since its inception, their devices are firmly based in audiological research and because of it, the strategies they use tend to be unique. For instance, they believe that the very soft sounds of speech are essential for understanding. So they amplify them to fit within your residual hearing.

This presents its own technical problems, and Widex was one of the only manufacturers to do it up to recently. That is just one example of what they have done differently. Widex were the first hearing aid brand to introduce live machine learning to their hearing aids with the introduction of the Evoke in 2018.

**Widex Hearing Aids**
Widex hearing aids are released on a platform which has four levels of technology and a family of hearing aid models at each level. It appears that this is the way they will continue to launch hearing aids in the future, so it is worth me explaining.

The premium level of technology in all of the recent Widex devices has been the 440. The technology levels drop via the 330, 220 and finally the 110. The technology levels are differentiated by features, the one with the latest and best Widex features is always the 440.

**The Platform**
Widex changed the way they designated their hearing aids with the launch of the Clear platform in 2009. Since then, they have named their hearing aid platforms using one name such as Clear, Dream, Unique and most lately Evoke. Within the platform is a full range of Widex hearing aid types at four levels of technology.

The Evoke is the newest top of the range hearing aids from Widex. The Evoke platform or E-Platform is the first ever range of hearing aids with machine learning capabilities. Although, the machine learning feature is only available on The Evoke Fusion 2, which is the direct connection or Made For iPhone hearing aid.
In essence, it is one of the latest Bluetooth enabled hearing aids just like the Widex Beyond before it. Widex says that the Evoke begins the era of intelligent hearing, where the quality of your listening experience will evolve in real time and real life.

With machine learning enabled, the Evoke range will continue to learn from you (and millions of others) as you use them so that you will hear sound perfectly.

Widex new SoundSense Technology means that every time you use EVOKE hearing aids, they evolve in their function. That's why they call them the world's first smart hearing aid. That’s because when you (and others across the world) personalise your listening experience, EVOKE learns from different situations and your inputs.

Widex then uses anonymous data from your changes to create a better listening experience for everyone. That means that the hearing aids you buy will be better tomorrow than they were today. Widex has already used the system to push out an update in functionality to Evoke hearing aids. How long they will continue to do so is anyone’s guess though.

**Widex Evoke Hearing Aid Prices**

We would expect the Evoke hearing aid range to be sold at prices from £1000.00 to £2200.00 depending on the technology level in the UK also dependent on the Practice and location. We would expect the range to be sold at prices from €1100.00 to €3000.00 in Ireland. We would expect the range to be sold at prices from $1400.00 to $3200.00 in the USA.

**Widex Evoke Hearing Aids**

Widex has a full line of hearing aids in every family, so that means within the Evoke platform, they offer Behind The Ear devices (BTE), Receiver in canal Devices (RIC) and custom In The Ear devices (ITE). Those devices would include:
CIC-M: This is the smallest of the range of custom ITE hearing aids; it is a non-wireless micro completely in canal device using a size 10 battery.
**CIC:** This is a slightly larger custom ITE device; it is a wireless completely-in-canal device using again a size 10 battery.

**Custom:** This is a newly introduced wireless hearing aid model, it is in between the CIC and the XP but it offers a lot more versatility. For the first time in a long time, these devices will offer physical controls which mean you can have a volume control or a programme button on them. Unfortunately, the device will not have a telecoil. They are run on a 312 battery which means longer battery life.
**XP:** The XP is for all intent and purposes a half shell type custom ITE device. It is a wireless in-the-ear device with a telecoil using a Size 312 battery.

**PASSION:** The Passion has for many years been the smallest RIC hearing aid available, but it has lost that honour to the new Unitron Now. It is a wireless mini receiver-in-canal device which uses a Size 10 battery. The size does limit the device though; it has no telecoil or programme button.
**FUSION:** The Fusion is a larger wireless receiver-in-canal device; it comes with a push button and telecoil and runs on a size 312 battery.

**FUSION 2:** The Fusion 2 is very like the Fusion, it is a larger wireless receiver-in-canal device; it comes with a push button and telecoil and runs on a size 312 battery. The difference is that the Fusion 2 is a Made For iPhone hearing aid.
The Fusion 2 can also be fitted with a rechargeable system. Widex is the last hearing aid brand to use the Z Power silver-zinc rechargeable system. Just lately, they have announced an upgraded version of it.

**FASHION:** The Fashion was introduced a couple of years ago as a replacement for the original 9 and 19 configurations, it is wireless slimline power BTE which can be used with a thin tube or a standard tube and mould. It has a volume control and telecoil and is powered by a size 312 battery.
**Fashion Power**: Pretty much exactly the same as the Fashion but designed to deliver for profound hearing losses.
**FASHION Mini:** The Fashion Mini was introduced in 2016 as a replacement for the original M configuration; it is wireless slimline mini BTE which can be used with a thin tube or a standard tube and mould. It is an exceptionally discreet BTE and is powered by a size 312 battery. It offers the discretion of a RIC with the reliability of a BTE, an excellent combination.

Each of these hearing aid types would be available in the four levels of technology available from Widex within the Evoke platform. For instance, there is a Widex Evoke CIC-M 440, 330, 220 and 110 available.
**Phonak**
Phonak is a Swiss manufacturer of hearing aids who are owned by Sonova. They are one of the biggest hearing aid manufacturers in the world. They have been manufacturing hearing aids for over half a century and provide their devices in over 100 countries around the world. While they were once known for hearing aids for Children, they have become known for leading hearing aid technology that is suitable for all.

Phonak are rated as one of the best hearing aid manufacturers around today, and they consistently work to improve their technology. Any experience I have had with Phonak hearing aids has been a good one and customers are always impressed with the benefit they provide.

**Phonak Hearing Aids**
Phonak do things a little differently than the other manufacturers when it comes to naming their hearing aids. They do introduce their hearing aids as easily identifiable platforms, and they do use numbers to signify technology level. However, they split their hearing aid types with different names.

For instance, a flagship or premium range hearing aid from Phonak will use the number 90 while a basic level hearing aid will have the number 30 in the name. The four levels of technology are the 90, the 70, the 50 and finally the 30. Their BTEs are called Bolero, their ITEs are called Virto, and their RIC / RITEs are called Audeo. They also offer super power hearing aids named Naida.

**The Platform**
There are currently two Phonak hearing aid platforms available. The Belong platform is Phonak’s latest full range hearing aid platform. However, they have introduced a new platform called the Marvel, but it is only available in the Audeo range (RICs/RITEs). However, I am led to believe that at least some of the BTE Marvels will be released in October 2019 with the custom hearing aids to follow early 2020.

The Marvel has caught the imagination of both the public and the professionals who dispense hearing aids equally. I have worn a set, and I have been extremely impressed with them.
The Hearing Aids

I will discuss both the Audeo Marvel and the Belong range here.

Audeo Marvel Hearing Aids

The Audeo range is the first part of the Marvel platform to be introduced. The Marvel Audeo family will be made up of five hearing aids of which two will be rechargeable. The smallest traditional Zinc Air battery size will be the 312. The full Audeo range will only be available in quarter three 2019, below you can see a quick explanation of the devices and their expected availability.

The devices will be available in four levels of hearing aid technology as you would expect from Phonak. For the first time ever though, Phonak will make the rechargeable devices available at every level of technology.

Made For Any Phone

While most of the hearing aid brands went for Made For iPhone hearing aids, Phonak decided that they would go a different way with their mobile phone connectivity. They chose one that would give them a direct connection to any mobile phone.

Phonak relied on the traditional Bluetooth protocol, which offered tremendous benefits. It meant that any hearing aid they produced would be technically able to connect to any Bluetooth enabled device, not just phones. That strategy also presented real technical difficulties. The first Made For Any Phone hearing devices (The Audeo B-Direct) did not offer stereo audio streaming of phone calls or any other audio. It also ensured that Phonak's quite famous ear to ear features did not work.

A New System, No Limits

The new Marvel platform does not have any of those limitations. The Marvel will allow users to experience stereo streaming audio from any Bluetooth enabled device, that includes most mobile phones available, computers, even some modern TVs.

Marvel users can have that audio streaming with the full benefits of Phonak's ear to ear features (Binaural Voice Streaming Technology BVST for short). That all means an excellent new hearing aid platform with no limitations.

Fully Featured Hearing Aids
As I said, these hearing aids aren't de-featured in any way. They include all of the latest Phonak features, including their much-celebrated ear to ear features. They also have a brand new sound management system, which they call Autosense 3.0.

It recognises and automatically adapts to precisely match more listening situations than ever before. Autosense 3.0 also classifies streamed signals and will adjust how it works to help you to hear the way you should.

**Multi-functional and Feature Rich Hearing Aids**

These hearing devices are hugely multi-functional and feature-rich. The Marvel contains probably every single one of the current headline features in the hearing aid world, and they have even thrown in some new ones, here's the quick list:

- **Stereo Bluetooth streaming:** Stereo streaming from any Bluetooth enabled device, that means iPhone, iPad, laptops, computers, Macs, Android phones, Windows phones, hell any Bluetooth-enabled phone.
- **Real Hands-free calling in stereo:** Like the Audeo B-direct, the Marvel offers true hands-free calling from Bluetooth-enabled phones and VOIP services like Skype, except, to both hearing aids.
- **TV Streaming:** Marvel can stream directly from Bluetooth-enabled TVs, and can also stream from the Phonak TV Connector accessory.
- **Rechargeability:** They say both Marvel rechargeables will deliver a full day of hearing aid use from a single charge.
- **Remote adjustments:** Marvel hearing aids can be adjusted remotely by your hearing expert.
- **New App Eco-System:** Brand new apps to make life easier and engage the consumer in the process.
- **RogerDirect:** This is really fascinating, for the first time, users will be able to stream from Roger devices directly to their hearing aids (won’t happen until late 2019).
- **Full Phonak Feature Set:** The Marvel will offer full and up to date inter-ear features.

**Stereo Bluetooth streaming**

Marvel will directly stream stereo audio from any device capable of streaming audio via Bluetooth. This includes almost any device you can think of. You can connect it directly to your Android phone; you can connect it directly to your Mac Book or Windows laptop.

You can even connect it directly to any Bluetooth enabled television. That is pretty amazing, that is a direct connection without any streamer. The quality of streaming
audio is excellent; sound is full and bright. Music is warm and full, and phone calls are clear.

**True Hands-Free Calling**
The Marvel delivers true hands-free calling in stereo. You will hear your phone calls in both ears, giving you a better chance at understanding what is being said. Hands-free means you don't need to touch your phone. Your phone can be up to thirty feet away. You simply hit the button on your hearing aid to answer the call.

I loved these feature, there is a real feeling of freedom delivered by just touching your hearing aid to answer a call and chat away. My experience with it was that I never had any difficulties understanding what the caller was saying, however, in some noisy situations, they seemed to have some trouble with what I was saying.

**More Than Just Audio Connection**
The Bluetooth connection is being used for more than just audio streaming, though. They will also use that same connection for data exchange between the mobile phone and the hearing aids. This ability offers much more benefits for consumers and professionals alike. The data exchange is the core of the new ability to remotely fine tune the hearing aids in real time and for the user to give real-time day to day feedback with the new Hearing Diary.

**The Models**

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**Audeo Marvel R**: The Audeo Marvel R is Phonak's latest rechargeable Made For Any Phone hearing aid, it is quite discreet and can be used with several receiver variations meaning it can cover a lot of hearing losses. The device will connect directly to any Bluetooth enabled Mobile phone and will stream phone calls and audio in stereo. The devices are available worldwide.
**Audeo Marvel 312**: The Audeo Marvel 312 is a very small RIC device which uses a size 312 battery, it is quite discreet and can be used with several receiver variations meaning it can cover a lot of hearing losses. It doesn't have a telecoil although as always it is a wireless device. The device will connect directly to any Bluetooth enabled Mobile phone and will stream phone calls and audio in stereo. The devices are available worldwide.
Audeo Marvel 312 T: The Audeo Marvel 312T is a small RIC device which uses a 312 battery, it is still very discreet and can be used with several receiver variations meaning it can cover a lot of hearing losses. This device will have a telecoil. The device will connect directly to any Bluetooth enabled Mobile phone and will stream phone calls and audio in stereo. This device is available worldwide.
**Audeo Marvel 13T:** The Audeo Marvel 13T is a RIC device that uses a size 13 battery. It will be slightly bigger than the 312, but still pretty discrete. It can be used with several receiver variations meaning it can cover a lot of hearing losses. The device will connect directly to any Bluetooth enabled Mobile phone and will stream phone calls and audio in stereo. This device is available worldwide.
**Audeo Marvel RT:** The Audeo Marvel RT is a rechargeable RIC hearing aid which will have a telecoil. It can be used with several receiver variations meaning it can cover a lot of hearing losses. The device will connect directly to any Bluetooth enabled Mobile phone and will stream phone calls and audio in stereo. This device will not be available until late 2019.

**Audeo Belong Hearing Aids**
With the introduction of the Belong platform that has changed. The Audeo Belong range has five different types.
Audeo B-10: Very small RIC device using a size 10 battery, it is quite discreet and can be used with several receiver variations meaning it can cover a lot of hearing losses. It doesn't have a telecoil although as always it is a wireless device. It has a button but no volume control.

Audeo B-312: Again a very small RIC device, however, it uses a size 312 battery, it is still very discreet and can be used with several receiver variations meaning it can cover a lot of hearing losses. Like the 10, it doesn't have a telecoil although as always it is a wireless device. It has a button but no volume control.

Audeo B-312T: Slightly bigger than the 312, it is still a small and discrete device RIC which uses a size 312 battery; it can be used with several receiver variations meaning it can cover a lot of hearing losses. Unlike the 10 and the 312, it has a telecoil as well as being a wireless device. It has a button but no volume control.

Audeo B-13: The largest of the Audeo B RIC range, it runs on a size 13 battery and can be used with several receiver variations meaning it can cover a lot of hearing losses. The 13 comes fully loaded with a telecoil, programme button and a volume control as well as being a wireless device.

Audeo B-R: The RIC device that all the hype of late has been about, a rechargeable hearing device running on Lithium-ion power. A solid 24 hours of use from one three hour charge. It can be used with several receiver variations meaning it can cover a lot of hearing losses down to profound. It is also a wireless device with a programme button but no volume control or telecoil. The Audeo B-R is only available in the top three levels of technology though and not the entry level.
Audeo B-Direct

These were Phonak’s very first Made For Any Phone hearing aids and they were very interesting devices that offered a direct connection to any Bluetooth enabled mobile phone.

The Audeo B-Direct connects to any Bluetooth® enabled mobile phone, directly without a streamer, and offers true hands-free calling. As it supports the classic Bluetooth protocol, it provides direct connectivity to cell phones – including Android, iPhone® and even classic cell phones – with no extra body-worn streaming device required.

No Music Streaming

Unfortunately for people who like to stream music or audiobooks from their phone, this hearing device isn't the answer. While it delivers astonishing new power over mobile phone calls, it doesn't allow the type of streaming that delivers music or other audio. However, they have thought about music lovers and your TV viewing habits.

Hearing aids that double as wireless TV headphones

They have also introduced an accompanying TV Connector, which uses their proprietary AirStreamTM technology. It is designed to be a state-of-the-art compact multimedia hub that seamlessly connects wearers to their favourite TV programming for an immersive audio experience.
It’s a plug and play solution that automatically turns a pair of Audéo B-Direct hearing aids into wireless TV headphones. The TV Connector can also connect and transmit to multiple sets of Audéo B-Direct hearing aids simultaneously.

**Three levels of technology**
The device is only available in three levels of technology, the 90, the 70 and the 50, so there is no entry-level device.

**New Accompanying App**
There is a new app to go with the devices for smartphones; the app offers the typical features you would expect.

Volume adjustment, programme changes, you can also rename the programmes to make them easier to remember. The app will show a list of the available audio sources and allow the user to control the balance of audio when streaming.

**Virto Hearing Aids**
The full Virto Belong hearing aid range has now been delivered, and it includes the new Titanium model. Phonak say that the Virto B is the world’s first hearing aids with Biometric Calibration, which take your individual ear anatomy and hearing needs into account.

They say that they will identify over 1600 biometric data points in and on your ear, and the unique calibration settings are calculated for each Virto B hearing aid. In this way, Virto B can more reliably sense where the sound is coming from, thereby giving you access to a better hearing performance.

**Using The Outer Ear**
Phonak are the first ever hearing aid manufacturer to carefully map the outer ear to take advantage of its natural abilities. The outer ear naturally heightens some sounds while also helping us to identify where sounds are coming from. They say that this new process will deliver a 2dB signal to noise ratio improvement. Basically means it will make the signal (what you want to listen to) 2dB higher than the noise.2dB doesn't sound like much but combined with all the other strategies that Phonak use it will be a marked improvement.

**Fully Automatic**
The Virto hearing aids are fully automatic and run on their latest AutoSense OS™. The Virto B is available in six models to match your hearing needs.
**Four Levels of Technology**
It is also available in the usual four levels of technology, the 90, 70, 50 and 30. They say that there will also be a Virto B CROS.

The currently available Virto hearing aids are:

**Virto B-10 NW O**: This is the smallest of the devices. The 10 means it takes a size 10 battery, NW means no wireless, so you miss out on all of the features for which wireless is needed. O stands for omnidirectional, which means that you don't get the benefits associated with dual microphones.
**Virto B-10 O**: This is the same as the previous model but with wireless technology.

**Virto B-10**: This is again the same as the others but with dual microphones squeezed on.

**Virto B-312 NW O**: This device is actually a slightly larger mini-canal device with a 312 battery, unfortunately, to get the discretion, you lose out on the wireless features, and you only get omnidirectional microphones.
**Virto B-312:** This device is a more substantial "half shell" aid that takes a size 312 battery.

**Virto B-13:** This is a "full shell" aid that takes a size 13 battery.

**Virto B-Titanium Invisible Hearing Aids**

This device is quite ground-breaking; it is the first hearing aid device to use medical grade titanium to form the custom shell. While this alone is innovative, they have used
the properties of the metal to ensure that they can offer discreet custom hearing aids to more people than ever.

A Titanium Shell
Phonak named the hearing aid as the Virto B-Titanium and said it will be the most discreet in-ear device they have ever made. It is a fascinating device that uses titanium for the shell instead of the usual hard acrylic. This is the first time that titanium has been used in the manufacture of a custom hearing aid.

Super discreet
Virto B-Titanium is the smallest Phonak in-the-ear hearing aid ever! It is for all intent and purpose, an invisible hearing aid device.

Half as Thin
Using titanium allows for a shell that’s half as thin as traditional custom shells. This will result in a deep, comfortable fit. Phonak say that the overall size is reduced significantly, thus increasing invisible-in-the-canal (IIC) fit rate by 64%. That simply means that more people than ever will be physically suitable for their latest invisible hearing aid.
Three Levels of Receiver
The device comes available with three levels of receiver, which allows it to cover even more hearing losses than ever before. Because of the use of Titanium, it also allows for bigger vents in their hearing aids, which mean fewer occlusion problems for people with good low-frequency hearing.

Fully automatic
Virto B-Titanium features AutoSense OS™. It adapts to every sound environment automatically for excellent hearing performance everywhere. There will be no need to adjust the hearing aids manually. Although, they can come with an optional push button for just that.

Technology Levels
The Virto B-Titanium will only be available in the 90 and the 70 levels of technology.

Will Fit More People Than Ever
The material is exceptionally strong, which allows Phonak to make the shell much thinner than ever before with even more strength. This, combined with the new component design, will enable them to deliver an invisible hearing device that they say will fit 68% more ears.

Bolero Belong Hearing Aids
With the launch of the new Bolero Belong platform of BTE hearing aids, Phonak have launched the anticipated lithium-ion rechargeable BTE, the Bolero B-PR. It is the first Lithium-ion rechargeable BTE to the market and the first rechargeable BTE for Phonak. They say that the battery pack will deliver 24 hours of hearing with one simple charge (expected results when fully charged, and up to 80 minutes wireless streaming time) which is in line with the performance of the Audeo B-R.

The P hearing aid style is quite a powerful aid and can be expected to be fitted to people with severe hearing loss. The device has a programme button, volume control and a telecoil on board. The amplification output of this aid demands a lot of power, so Phonak must be very confident with the battery technology.

In line with the Audeo Belong, the range will run on the new, improved AutoSense OS and will come in the usual four levels of technology. However, the new rechargeable option will not be available at the lowest level of technology.

The Range
The Bolero range is a full model line up with four models. They will include B-M, B-P, B-SP, and rechargeable B-PR.

**Phonak Bolero B-M**: The B-M model is the smallest of the range, a micro BTE powered with a 312 battery it will cover Moderate to Severe hearing losses. The device comes with a programme button and has an onboard telecoil. The device can be fitted with a thin tube fitting or a traditional tube and mould configuration. The device will be available in the four levels of technology, the 90, the 70, the 50 and the 30.

**Phonak Bolero B-P**: The B-P model is slightly larger, it is powered by a 13 battery cell and comes with a programme button, volume control, telecoil and will cover up to severe hearing losses. The device can be fitted with a thin tube fitting or a traditional tube and mould configuration. The device will be available in the four levels of technology, the 90, the 70, the 50 and the 30.
**Bolero B-SP:** The B-SP is the largest model; again, it is powered by a 13 battery and comes with a programme button, volume control and telecoil. The device will cover severe to profound hearing losses. The device can be fitted with a thin tube fitting or a traditional tube and mould configuration. The device will be available in the four levels of technology, the 90, the 70, the 50 and the 30.

**Bolero B-PR:** The B-PR is the rechargeable model which runs on a sealed and integrated lithium-ion power pack. The device is similar in size to the Bolero B-SP. It also has a programme button, volume control and telecoil. The device can be fitted with a thin tube fitting or a traditional tube and mould configuration. It will cover moderate to severe hearing losses, and it will be available in the 90, the 70 and the 50 levels of technology only.
Naida Hearing Aids

Again the Naida is currently only available on the Venture platform. It was the last of the Venture platform to be released, and I would not expect it to be updated for a while. The currently available Naida hearing aids are:

**Naida V RIC**: The Naida V RIC (Receiver in Canal) offers pretty fantastic power in a small package. The device which is a new form factor with a size 13 battery comes with three possible receiver options, the XS, the XP and the new X UP (for Ultra Power). The X UP option is a newly designed receiver which offers more output than the previous one. In essence, the option will cover a more severe hearing loss.
**Naida V SP:** The new Naida V SP is quite a small superpower hearing aid. It runs on a size thirteen battery and can be fitted with a power slim tube and tip which offers real discretion. The device can also be fitted with a standard thick tube and mould configuration. The SP runs on a size thirteen battery which accounts for that smaller size.

![Naida V SP](image)

**Naida V UP:** The new Naida V UP is again thinner and smaller than its predecessor with a new form factor. The power output of the hearing aid has been increased, giving it, even more, performance for even the most profound hearing loss. It is powered by a 675 battery and can also be fitted with a power slim tube and a custom tip.
**Starkey**
Starkey is an American hearing aid manufacturer who became famous for their custom hearing aids. They produced very discreet custom hearing aids at a time that others had problems doing it. They are exceptionally popular in the States, and there are more than a few providers in the UK that use them as a primary manufacturer.

I don’t like them, their hearing aid technology has always seemed okay, but I had a lot of problems with reliability. So much so that I just stopped using them.

**Starkey Hearing Aids**
Starkey is similar to the other manufacturers when it comes to naming their hearing aids. They do introduce their hearing aids as easily identifiable platforms, and they do use numbers to signify technology level. However, they too divide different hearing aid types with different names.

For instance, a flagship or premium range hearing aid from Starkey will use the number i2400 while a basic aid will have the number i1600 in the name. Their full line hearing aid offering is called Muse IQ, their IIC hearing aids are called SoundLens Synergy IQ and their Made For iPhone hearing aids are called Halo IQ.

**The Platform**
Starkey has a few hearing aid platforms floating around right now; they have a new platform called Livio and a slightly older one called the IQ platform. The Livio is of real interest to me, or at least the Livio AI is. I think it represents the future of hearing aids. Starkey is using the tagline “Welcome to the revolution”.

Believe it or not, I am inclined to agree with them, the Livio AI represents a revolution in hearing aid functionality. Are they any use as hearing aids? Haven’t a clue, I have yet to get a hold of a pair to experience them. Let’s discuss the Livio AI and the other stuff they have available.
Livio AI Hearing Aids
For the first time ever we have a hearing aid with built-in sensors, health tracking, fall detection and it translates 27 languages in real time. That's pretty revolutionary.

A hearing aid with hearable functionality
Starkey had teased the launch of the Livio AI for the longest time. They were talking about them mid-2018, but time dragged on with no sign. Eventually, on the 20th of March 2019, they had the UK launch in London which I attended.

The device has been a long time coming, and the outline of the functionality has excited a lot of people, I included. I believe the device represents a huge move forward within hearing aids. While I have heard a few people say that the broader functionality is just ancillary, I don't agree. I think the features are core to the devices and the users that they are designed for.

They Say Sound is Core
I have heard it said several times that sound quality is the real core focus of hearing aids, and that, of course, is true. Up to recently, Starkey really wasn't famous for sound quality, although that changed slightly with the launch of the Muse.

Starkey says that the Livio AI represents their very best sound quality yet and they have introduced some new sound processing features to drive that. Of course, they would say that, however, I listened to the devices at the launch briefly and they actually sounded pretty good.

Of course, that is as artificial as it gets and by no means can be seen as putting them through their paces.

Binaural Communication
I was amazed to find out that Starkey had not been using binaural compression before. I mean it was first introduced by Widex almost ten years ago, and everyone uses some form of it now.

Anyway, Starkey is finally using binaural compression. Basically, they leverage the communication between two Livio AI hearing aids to produce a more natural sound, preserve the natural sound cues and to drive a better experience in noisy situations. That communication also allows them to re-produce inter-aural level differences, which will enable you to localise sound better.

That in itself should help you to separate speech and noise a little better in noisy situations. As I said, I had a brief listen to them through headphones, the location was
pretty loud, and they sounded pretty good. It wasn't an authentic experience by any means, but with the limited, slightly artificial setup, they seemed okay.

**Spatial Speech Enhancement**
Starkey says that their new speech enhancement system will deliver a 10% reduction in cognitive effort in noisy environments and a pretty astonishing 80% reduction of noise. An 80% reduction against what is pretty unclear though.

**Transient Noise Reduction**
They have introduced a new system to handle transient or impact noises. The system identifies and reduces those noises quickly, which means a slamming door or dropped cutlery on a tile floor will not be as irritating.

**Bluetooth Hearing Aids**
The Livio AI are Bluetooth hearing aids, audio streaming and streaming of phone calls is limited to the iPhone at present. There was no mention of any plans to deliver Made For Android functionality. I would take it as said that if you want to get the very best out of these aids, you need to be packing an iPhone.

**The Features**
The feature set of these hearing aids is what sets them apart as innovative devices, here is a rundown:

- Translation in 27 languages
- Amazon® Alexa connectivity
- Rechargeable option
- Fall Detection and Alerts
- Heart Rate Measurement
- Voice-to-text Transcription
- Natural user interface with tap control
- Self Check for hearing performance
- Thrive Virtual Assistant, built on Google Assistant

Translation in 27 languages seems perhaps a little strange, but when you consider that older adults are exceptionally likely to travel, it starts to make sense. Starkey says that one of the core beliefs they have is that they enable communication, with live translation of different languages, they are doing that.

**Health Monitoring**
The Livio AI offers relatively decent health monitoring opportunities, while it monitors activity and now heart rate, it also monitors socialisation and how much time is spent engaging with people. The Thrive App uses all of this to give its scores.

**Thrive app and Livio AI hearing aids**
The health monitoring element of the Livio AI is offered via the Thrive App. It provides two measurements that both deliver the possibility of a score of 100 points. It focuses on a Body score and a Brain score.

The body score is calculated through a combination of activity, steps and overall movement. This information is tracked daily and accessed easily in the Thrive app. As I said, a daily score of 100 points is possible.

**Cognitive Health**
Starkey says that because of the critical connection between cognitive health and hearing health, Livio AI measures the brain benefits of wearing hearing aids. The metrics used to measure the Brain score include hours of daily use, social engagement and the tracking of active listening. Again the daily score of 100 points is possible.

Does it really give you a score based on cognitive health? No, it doesn't, however, it gives you a clear idea about some of the things that we know promote good cognitive health and I think that is a good thing.

Because there is a considerable link between hearing loss and a lot of other co-morbidities like heart disease or diabetes. Enabling health tracking in a hearing aid makes perfect sense, I mean you wear them all day, so they are the ideal device to monitor activity.

**Fall Detection & Alerts**
Starkey is leveraging the sensors in the Livio AI to detect falls, and they have set up a system in the Thrive App that allows an alert to go out to up to three different designated contacts. I honestly think that this is a stroke of genius, I have said for many years that hearing aids could be the ideal platform for the monitoring of activity and health of older people, ensuring that they can lead independent lives for longer. This system represents a big part of that concept.

When you hear the figures (from National Council On Aging) relating to falls for older people, it really begins to put the benefit of this feature in perspective:

- Every 11 seconds an older adult is treated in an emergency room for a fall
- Every 19 minutes an older adult dies from a fall
- $67.7 Billion in projected costs from fall by 2020

Older people fall down with alarming regularity and injure themselves, some of them die. The horrible thing is that some who die may have lived if help was quick enough to get to them. That's a hard pill to swallow, and I would imagine it would lead to great torture for a family.
The fall detection and alert system mean that if a Livio AI user falls, their loved ones should know about it instantaneously. I think that represents huge peace of mind.

**The Self Check**
The self-check feature in the Thrive app which will run a subroutine to check your hearing aids. It’s a handy tool that allows you to be sure if you need to see your professional or the receiver is just blocked with wax.

**Thrive Personal Assistant**
You activate the Thrive Personal Assistant with a tap on the hearing aids and then simply speak your query. At present, the Thrive Personal Assistant handles your questions in two ways.

The AI in the app decides if your question is hearing aid related or a broader general query. If it is hearing aid related such as how do I turn the volume up, the query is handled locally within the app. If it is a broader query, like why is the sky blue?, the app passes it on to Google to answer.

**The Models**
The Livio AI is available three models, a mini receiver in canal, a rechargeable receiver in canal and finally a behind the ear device. They are suitable for mild to severe to profound hearing losses.

**One Price Level**
The Livio AI is only available at the premium price level. There are lower level Livio ranges but they do not have all the AI features.

**SoundLens Synergy IQ**
The SoundLens was the first of the modern invisible hearing aids. While they are not suitable for everyone, they seem to be pretty solid devices. Anyone I have ever come across wearing them has been very impressed with them. The Starkey SoundLens Synergy IQ comes in two styles:

**Starkey SoundLens Wireless:** This is a wireless (invisible-in-canal) device; however, it is only available in the premium range i2400.

**Starkey SoundLens Non-Wireless:** This is a non-wireless (invisible-in-canal) hearing aid and it is available at all tech levels.
**Muse IQ**

The Muse IQ range comes in a variety of styles:

**Starkey Muse Mini BTE:** This is a wireless BTE device, powerful but discreet traditional type BTE hearing aid. With rocker switch and telecoil (size 312 battery).

**Starkey Muse BTE 13:** This is a wireless BTE device, powerful but discreet traditional type BTE hearing aid. With rocker switch and telecoil (size 13 battery).

**Starkey Muse Micro RIC 312t:** This is a wireless mini RIC (receiver-in-canal) device, small, ultra-discreet but powerful hearing solution. With push button and multiflex tinnitus therapy (size 312 battery).

**Starkey Muse RIC 312t:** This is a wireless RIC (receiver-in-canal) device, larger than the micro RIC but still a discreet but powerful hearing solution. With push button and multiflex tinnitus therapy (size 312 battery).

**Starkey Muse CIC:** This is a wireless CIC (completely-in-canal) device, small, ultra-discreet but powerful hearing solution with optional telecoil depending on the size of the canal (Size 10/312 battery).

**Starkey Muse ITC:** This is a wireless ITC (in-the-canal) device, small, ultra-discreet but powerful hearing solution, with a telecoil (Size 312 battery).

**Starkey Muse ITE:** This is a wireless ITE (in-the-ear) device, a powerful custom hearing solution with a telecoil (Size 13 battery).

**The Halo IQ**

Starkey was the second manufacturer to introduce Made For iPhone hearing aids, and this is their third update of them. I have personally worn the Halo 2 devices at the premium range, and I have to say they were pretty good devices. Nice crisp sound, good connection to the iPhone and great power delivered through the app. The Halo IQ range is a Made For iPhone technology which comes in four styles, all of which are receiver in canal devices:

**Starkey Halo IQ RIC 312:** This is a wireless RIC (receiver-in-canal) device, small, ultra-discreet, but powerful hearing solution. With push button and multiflex tinnitus therapy (size 13 battery).
**Starkey Halo IQ RIC 13:** This is a wireless RIC (receiver-in-canal) device, small, ultra-discreet, but powerful hearing solution. With push button and multiflex tinnitus therapy (size 13 battery).

**Starkey Halo IQ RIC 312 AP:** This is a wireless RIC (receiver-in-canal) device, small, ultra-discreet but powerful hearing solution. With push button and multiflex tinnitus therapy (size 13 battery). This device will cover very severe hearing losses.

**Starkey Halo IQ RIC 13 AP:** This is a wireless RIC (receiver-in-canal) device, small, ultra-discreet but powerful hearing solution. With push button and multiflex tinnitus therapy (size 13 battery). This device will cover very severe hearing losses.

**Starkey Technology Levels**

Starkey keeps to three levels of technology in its latest platform, the Premium i2400, the Advanced i2000, the Standard i1600. All of the hearing aids we have discussed here are available in those three levels.
Signia /Sivantos /Siemens
Siemens is a well-known German company, and their hearing aid division was one of the largest manufacturers of hearing aids worldwide. They sold their hearing aid division to a private consortium named Sivantos a couple of years ago. Sivantos have now changed the hearing aid brand to Signia. As I said earlier, Sivantos has now merged with Widex to form WS Audiology. However, the Signia brand will remain a factor for many years to come.

Signia Hearing Aids
Up to now, Signia has been similar to Phonak when it comes to naming their hearing aids. They do introduce their hearing aids as easily identifiable platforms, and they do use numbers to signify technology level. However, they split their hearing aid types with different names.

For instance, a flagship or premium range hearing aid from Signia will use the number 7 while a basic hearing aid will have the number 3 in the name. Their BTEs are called Motion, their ITEs are called Insio, and their RIC / RITEs were called Ace, Pure, carat and Cellion.

With the introduction of the new Nx range, the RIC / RITE naming seems to have changed. They appear to be calling the RICs Pure. They have also introduced a brand new RIC style that they are calling the Styletto. They also offer super power hearing aids named Nitro.

Telecare 3.0
This is an exciting development; Signia has made the Telecare service a live service. They were initially the first to offer Telecare with a limited fine-tuning option although Resound quickly followed with the launch of the LiNX 3D and their Remote Assist which had more functionality. Signia though rapidly expanded that fine-tuning option and added video calling to the system. Now they have enabled full live remote tuning with video support, which is a pretty huge breakthrough.

The new service means that you can set-up a video call with your hearing professional and explain the issue you are having in the situation you have it in. While you are
connected, your hearing professional can tweak your hearing aid’s settings live, and you can quickly assess if they are better.

The Platform
Signia latest platform is the Nx, and it is available across three levels of technology. It has a full range of model types including RICs, BTEs and ITEs.

Signia Nx Hearing Aids
Signia introduced the Nx hearing aids late in 2017, it introduced some outstanding new features.

Made For iPhone Bluetooth Enabled
The entire Nx range is Made For iPhone enabled hearing aids that offer a direct connection to Apple devices for audio streaming.

OVP, Own Voice Processing
Signia made a big deal of the OVP or Own Voice Processing at the launch, and these devices are the first hearing aids to process the user's own voice differently from everything else. In fact, they have dedicated a completely separate processor on the platform to facilitate that. They said that the strategy will increase the acceptance of a user’s own voice dramatically.

I Second That
I have to agree wholeheartedly with that sentiment, the OVP feature is fantastic. My experience with it has been pretty jaw-dropping. In the article Signia Pure 312 7 Nx Hearing Aids, Here is What You Need to Know, I talked in more depth about the own voice processing feature and why it might be of interest to you. The pertinent statement here though is:

When I was fitted with the Nx I was fitted with closed domes, I thought this isn't going to work as I heard my voice explode in my head. Then, we went through the own voice training protocol (count from twenty-one until it is happy it knows your voice). The feature was turned on, and no more occlusion, just like that. I was a bit speechless (that doesn't happen very often). By no more occlusion I mean no more auditory occlusion, I wasn’t caused any difficulty by my own voice.

For new users of hearing aids the sound quality of their own voice can be off-putting, but it is usually something that they get used to. However, as Signia point out, used to,
does not mean happy with. This system promises to deal with the issue, and it does it exceptionally well.

**Pure 13 NX:** This device is an updated version of their Pure 13 BT, it offers the new system which separately processes the wearer’s own voice. It comes with superior connectivity with direct streaming and the myControl App, which deliver personal control over the devices. The hearing aid has a rocker switch which allows programme changes and volume changes. It is IP68 rated and can be fitted with the four levels of receiver power, making it suitable for most hearing losses. Signia say that users will enjoy the longest wearing time in its class while streaming. It also has access to the full live remote support via TeleCare 3.0.
**Pure 312 Nx:** This device is a very svelte Pure (RIC) device using a 312 battery, again it offers the new system which separately processes the wearer’s own voice. The hearing aid has a rocker switch which allows programme changes and volume changes. It is IP68 rated. It can also be fitted with the four levels of receiver making it suitable for most hearing losses. It comes with superior connectivity with direct streaming and the myControl App. It also has access to the full live remote support via TeleCare 3.0.
Motion 13 Nx: This device is a BTE device using a 13 battery, again it offers the new system which separately processes the wearer’s own voice. It also comes with superior connectivity with direct streaming and the myControl App. It also has access to the full live remote support via TeleCare 3.0. The device also offers the rocker switch for programme and volume control changes. This is a pretty versatile device which offers a telecoil option with the simple switching of the battery door. The device is IP67 rated for dust and moisture.
**Pure 10 Nx:** This ultra-small device is a very svelte Pure (RIC) device using a 10 battery, again it offers the new system which separately processes the wearer’s own voice. The hearing aid offers no controls; however, paired with a remote control, you will have access to programme changes and volume changes. It is IP68 rated. It can also be fitted with the four levels of receiver making it suitable for most hearing losses. It comes with superior connectivity with direct streaming and the myControl App. It also has access to the full live remote support via TeleCare 3.0. The device is available in three levels of technology.
**Pure Charge N Go Nx:** This device is a very svelte Pure (RIC) device which is powered by a Lithium-Ion rechargeable battery pack, again it offers the new system which separately processes the wearer’s own voice. The hearing aid has a rocker switch which allows programme changes and volume changes. It is IP68 rated. It can also be fitted with the four levels of receiver making it suitable for most hearing losses. It comes with superior connectivity with direct streaming and the myControl App. It also has access to the full live remote support via TeleCare 3.0. The device is available in three levels of technology.
**Motion Charge N Go Nx**: The new Motion Charge N Go hearing aid is a very versatile device that offers coverage for mild, moderate and severe hearing losses. It can be fitted with a thin tube and instant tip, which you can see above, or a traditional ear hook, tube and ear mould. It means that people who like BTEs now have a rechargeable option.
**Styletto Connect:** The Styletto Connect hearing aid is a discreet Made For iPhone rechargeable device that offers coverage for mild to moderate hearing losses. It is attractive if different design and reminds you of high-end electronics as opposed to traditional hearing aids. The charger case is outstanding, and it delivers four extra charges for the devices, which means you can go away for a long weekend and forget your plug.

Like the original, the receiver is fixed in the hearing aid and can not be replaced in the clinic, it will have to be a factory repair job. That means that you will need to take care of it to ensure it doesn't fail. Generally, people do not take care of their receivers, we see them failing all of the time through user negligence. They get full of wax and moisture and die. The Styletto Connect is available in three levels of technology

**Signia In The Ear Hearing Aids**
Signia offers four In The Ear hearing aids in the Insio range, the Insio IIC, the Insio CIC, the Insio ITC and the Insio ITE:
**Insio NX IIC**: The IIC is a non-wireless invisible-in-canal hearing aid that uses a size 10 battery. The device is not Bluetooth enabled.

**Insio NX CIC**: The Insio CIC is a wireless completely-in-canal device that uses a size 10 battery. This device is not Bluetooth enabled.

**Insio Primax ITC**: The Insio ITC is a wireless in-the-canal hearing aid with a telecoil, and it can be ordered with a size 10 or 312 battery. This device is a Bluetooth enabled hearing aid.

Insio Nx ITE: The Insio ITE is a wireless full shell in-the-ear hearing aid with a telecoil, and it can be ordered with a size 312 or 13 battery. This is a Bluetooth enabled hearing aid.
**GN Resound**

GN Resound is another Danish hearing aid manufacturer with a long history. They are one of the top 5 manufacturers in the world and are renowned for innovation and continuously advancing technology. Since they began in the 1940s, Resound has continued to grow, but it is in the last 20 years, their innovation has pushed them to new heights.

They have had a lot of firsts over the years; their latest first was Made For iPhone hearing aids. They are still the only manufacturer that offers a full range of Made For iPhone (MFI) hearing aids including BTEs, RICs and ITEs.

**Resound Hearing Aids**

Resound are similar to the other manufacturers when it comes to naming their hearing aids. They introduce their hearing aids as easily identifiable platforms, and they do use numbers to signify technology level. Each platform would have a full range of hearing aids available.

For instance, a flagship or premium range hearing aid from Resound will use the number 9 while a basic aid will have the number 5 in the name. Their latest full range hearing aid offering is called the LiNX 3D, although they have a newer limited range called the LiNX Quattro.

**The Platform**

As I said, Resound has a few hearing aid platforms floating around right now, the very latest full range of hearing aids is called the Linx 3D platform. However, they have introduced a new limited hearing aid range called the Quattro, they also have the Enzo 3D range. They are all MFI (Made For iPhone) hearing aids.

**Linx Quattro Hearing Aids**

Resound released the Linx Quattro range late in 2018. The Quattro works on an entirely new chipset from Resound that delivers a massive improvement in processing power and speed. Resound has used that chipset to full effect by completely re-designing their
signal processing and the hearing aid features. They have also increased the bandwidth of the devices and the input range, which should translate to a cleaner, more natural sound.

Resound have redesigned the wireless radio though and they say that it is more powerful than ever before. That should translate into stable connection to the iPhone and hopefully Android phones when Android releases the new version.

**Two Models, Three levels of Technology**
The Quattro is only available in two Receiver In Canal models across three levels of technology. The devices are suitable for hearing losses from mild to severe to profound.

**Made For iPhone, Made For Android**
The Quattro will be the first-ever Made For Android hearing aid available. Resound, and Google are working together to deliver hearing aid support to Android in 2019. That will mean that the Quattro will be able to receive streamed audio from Android phones directly, without the aid of an intermediary streamer.

Of course, there are caveats. When the system is introduced, it will probably only work on Google Pixel 3 phones initially. However, I would imagine the big names in phones like Samsung will follow quickly enough.

Here is a quick rundown of the Quattro:

- The devices will be available in three new technology levels
- The devices are Receiver In Canal devices
- The devices are Bluetooth hearing aids
- The devices use a brand new chip platform
- The chip has 100% faster processing than 3D
- The chip has 100% additional memory over the 3D
- Resound are using a new way of handling directionality inputs
- They have introduced a redesigned wireless radio with extra signal strength
- They have extended the bandwidth of the devices giving extra high-frequencies
- They have increased their dynamic input range, calling it industry leading
- The devices are available with a Lithium-ion rechargeable battery pack and without
- The rechargeable hearing device will deliver 24 hours of use with 50% streaming on a three-hour charge
- The Lithium-ion devices will deliver 30 hours of use without streaming on a three-hour charge

**The Models**
LiNX Quattro LT-61: The LiNX Quattro LT-61 is a rechargeable direct connection, Bluetooth enabled or Made For iPhone hearing aid just like all the LiNX devices before it. Making it a rechargeable device makes a lot of sense, although they have used the chip upgrades to improve power consumption, a rechargeable option allows you the comfort of never having to worry about hearing aid batteries. The battery life is also fantastic, they say that you will get 24 hours of life even if you are streaming for 50% of the time, that's pretty amazing. The device has no telecoil onboard, but if you pair it to a multimic you can use the telecoil in that to stream to your hearing aids.
**LiNX Quattro LT-62:** The LiNX Quattro LT-62 is a traditionally powered hearing device using a size thirteen battery. It is slightly larger than the LT-61, but it comes with an onboard telecoil. The new power management system should mean that the size 13 battery lasts even longer.

**Premium Plus Price Point**
Resound have not introduced the devices as a replacement for the LiNX 3D. Instead, they have added them as a new premium price point above the LiNX 3D 9, 7 and 5. As I said, they have introduced two RIC models, it will be interesting to see if they expand the models in late 2019.

**Linx 3D Hearing Aids**

The LiNX 3D hearing aid range comes in a variety of styles that include:

**IIC Invisible in Canal:** This is a non-wireless invisible-in-canal device. It uses a size 10 battery. So it really isn’t a Made For iPhone device.

**CIC Completely in Canal:** This is again a non-wireless completely-in-canal hearing aid. It uses a size 10 battery. Same as above when it comes to connectivity.
ITC In The Canal: This is a slightly larger wireless Made for iPhone in-the-canal hearing aid. It uses a size 312 battery.

ITE In The Ear: This is a larger full shell wireless Made for iPhone in-the-ear hearing with a telecoil. It uses a size 312 or 13 battery.

MIH-S Microphone in Helix Small: Resound is the only manufacturers who offer this style of hearing aid, it is a non-wireless small microphone-in-helix hearing device. The microphone is attached to a wire that is placed in the helix of your ear. It uses a size 10 battery.

MIH Microphone in Helix: This is a larger version of the wireless Made for iPhone microphone-in-helix hearing aid. This version has a telecoil. It uses a size 312 or 13 battery.

RIE 61: This is a wireless Made for iPhone receiver-in-ear hearing aid with a push button. It uses a size 312 battery.

RIE 62: This is a slightly larger wireless Made for iPhone receiver-in-ear hearing aid that is equipped with a volume control and telecoil. It uses a size 13 battery.

BTE 77: This is a wireless Made for iPhone BTE that can be used with a thin-tube or standard BTE tubing and mould. This device has a push button, volume control and telecoil. It uses a size 13 battery.

BTE 88: This is a wireless high-power Made for iPhone BTE. The device is fitted with a push button, volume control and telecoil. It uses a size 13 battery.

Enzo 3D Hearing Aids
The Enzo 3D superpower range is offered in two styles:
**Enzo 3D 88 BTE:** This is a wireless high-power Made for iPhone BTE. The device is fitted with a push button, volume control and telecoil. It uses a size 13 battery.
Enzo 3D 98 BTE: This is a wireless high-power Made for iPhone BTE. The device is fitted with a push button, volume control and telecoil. It uses a size 675 battery.

Resound Technology Levels

As I said, there are three levels of technology in every Resound platform, in the premium ranges, the levels are the Premium 9, the Advanced 7, and the Standard 5. With the introduction of the budget Vea range they did something different, they offered a 1, 2 and 3.

They also limited the types of hearing aids available in the range, for instance, there was no MIH in the Vea range. The range seems to have become obsolete and Resound appears to have removed it from their websites.
**Costco Hearing Aids**

This is the first time I have included the Costco Kirkland range in the book. Considering many of my readers are from the US, it makes sense to do so. Costco is the most significant private provider of hearing aids in the USA. Costco introduced hearing aids as a part of its offerings way back in 1989, and they have successfully built up their hearing centre network since then.

In general, the feedback on Costco provided hearing aids is generally good to mixed, just as it is from any other provider. Many Costco hearing professionals offer best-practice hearing care, including Real Ear Measurements. However, that doesn’t seem to be consistent across all Costco hearing centres. The one thing that everyone agrees on is that the price of hearing aids at Costco is outstanding.

The Kirkland Signature 9.0 hearing aid range is made up of one Bluetooth enabled Receiver In Canal hearing aid at one premium level of technology. The hearing aid will fit most hearing losses because of the interchangeable receivers (speakers). The Kirkland Signature 9.0 can use four different receivers, which allows the hearing aid to cover hearing losses from mild to severe to profound hearing losses.
The device is an IP68 rated hearing aid with a multi-functional control button that is powered by a 312 zinc-air battery. It doesn't have a telecoil onboard. It is a Bluetooth hearing aid, and unlike other Bluetooth hearing aids, it offers a direct connection to any Bluetooth enabled cell phone.

The new Kirkland Signature 9.0 is manufactured by Sonova, and it is built upon the same hardware as the Phonak Marvel and Unitron Discover. It is essential that you understand that the Kirkland 9.0 is similar to these hearing aids but is not precisely the same.

**Made For Any Phone**
The Kirkland 9.0 uses the Sword chipset from Sonova and is a Made For Any phone device just like the Marvel. That means that it will connect to any cell phone with a Bluetooth radio. So that means, iPhones, Android phones and even dumbphones.

**Hands-Free Phone Calls**
The hearing aids provide hands-free phone calls from your connected cell phone. You simply press the button on the hearing aid to answer the call and talk away. You can also end the phone call with a simple touch of the button on your hearing aids.
**TV Audio Streaming**
There is a TV streamer accessory for the device that allows you to stream audio from any TV or sound system directly to your hearing aids without an intermediary streamer. The TV accessory provides excellent sound quality.

**Kirkland 9.0 Prices**
Overall, the Costco Kirkland Signature 9.0 Hearing Aids seem like pretty good hearing aids considering their purchase price of $1499.99 for a pair. As I said, the technology is not identical to the Phonak Marvel or Unitron Discover line of devices, but they are similar.

Kirkland hearing aids or any of the hearing aids available at Costco do not have any kind of Tinnitus Features inside of their devices, so it’s something you need to take into consideration if that’s important to you.

**Kirkland Signature 9.0 Features**
The Kirkland Signature 9.0 uses the Sonova Sword chip for communication and the features are as follows:

- Third-generation enhanced automatic operating system
- Premium-level classification of environmental sounds and streamed media
- Binaural signal processing and binaural beamforming
- Direct connectivity to any Bluetooth phone with audio streaming to both ears
- Hands-free phone calls with built-in microphones
- 20 fine-tuning channels, 9 automatic programs, 3 manual programs
- Receiver-in-canal (RIC) form factor with 312 battery
- 4 receiver power levels
- Accessories: TV Connector

**The Conclusion**
The Kirkland 9.0, just like every Kirkland aid before it, is a great offering. It is an ideal hearing aid for people with bog standard, run of the mill hearing loss that responds well to amplification. The absence of a telecoil means that it is not an ideal solution for people who need more than just a hearing aid to get on in complex solutions. As well as that, the lack of a rechargeable option means that Kirkland buyers will miss out on the ease of use of that function.
The Kirkland 9.0 isn't a Phonak Marvel hearing aid, even though some will say it's similar. The truth is that it is similar, but the Phonak Marvel range offers so much more than the Kirkland, including:

- The call transcription app
- Live real-time remote fine-tuning
- A rechargeable option
- Tinnitus treatment ability
- Access to RogerDirect
- Telecoil options.
Hearing Aid Types, an introduction

Modern hearing aids have evolved exponentially in the last five years; they really are outstanding at what they do. One thing I will say though is that they are just an aid to hearing; they will not replace the natural hearing ability that you have lost.

That warning should not put you off, it is just given so that you can manage your expectations. It is also provided so that you can appreciate what you are going to get. My best advice is that you should buy the best set of hearing aids you can afford. I think though the key is, that you buy them from someone who is going to do their level best to help you succeed with them.

Best Advice

Because, if you have a hearing loss, you need to treat it. The growing evidence concerning the consequences of untreated hearing loss is worrying. We are seeing stronger links between untreated hearing loss and cognitive issues. We are also seeing substantial evidence that hearing aids have a beneficial effect on cognitive ability.

We as a population are generally living longer, it appears that treating hearing loss will keep you sharper, more active and generally healthier as you age. There is clear evidence that shows that wearing hearing aids when needed, will contribute to good general health, so what’s not to like?

Be realistic with your expectations of the hearing aids that you purchase, the different levels of technology make a big difference to the benefit delivered within different sound environments. I will explain them clearly a little later in the book.

While there is a vast range of hearing aids available, they usually fall within just a few overall general types. Each type has different strengths and weaknesses and differing suitability for different people. Let’s explore the different types, including the pros and cons of each one.

What Are The Hearing Aid Types?

Three hearing aid types are most spoken about, they are as follows:
**BTE Hearing Aids:** These devices are worn with the hearing aid on top of and behind the ear. All of the parts are in the case at the back of the ear, and they are joined to the ear canal with a sound tube and a custom mould or tip.

**ITE Hearing Aids:** These are custom-made devices, all of the electronics sit in a device that fits in your ear, and they come in many sizes including CIC (Completely in Canal) and IIC (Invisible in Canal).

**RIC RITE Hearing Aids:** These devices are similar in concept to BTE hearing aids, with the exception that the receiver (the speaker) has been removed from the case that sits at the back of the ear. It is fitted in your ear canal or ear and connected to the case of the hearing aid with a thin wire.

**Wireless and Bluetooth Hearing Aids**

Before we delve a little deeper into the different types of hearing aids, it is essential to discuss wireless hearing aids and the devices that have become commonly known to the general public as Bluetooth hearing aids. All the hearing device manufacturers have wireless hearing aids, and most have introduced Bluetooth hearing aids over the last few years.

They aren’t necessarily the same thing. Let’s talk about wireless before I explain Bluetooth later. While wireless hearing aids work with Bluetooth connections, they aren’t precisely Bluetooth. Most of the manufacturers designed their own flavour of wireless signal. Wireless communication between hearing aids and between hearing aids and other accessory devices has really been a game-changer for people who wear hearing aids.

Not just has it made it easier for people to enjoy their TV, phone calls and group situations, the wireless communication has also enabled jaw-dropping features (at least for us nerds) in the hearing aids that deliver a much better experience for their users.

In the very recent past (since 2017 maybe) many of the hearing aid brands are dropping their own wireless systems and moving towards the direct connection that Bluetooth provides.
RIC Receiver in Canal Hearing Aids
RIC/RITE hearing aids, sometimes called speaker in the ear, are powerful but discreet hearing aids. Let's take a more in-depth look at them.

RIC / RITE Hearing Aids
DISCREET BEHIND THE EAR DEVICES

RIC (Receiver in Canal) / RITE (Receiver In The Ear) were first introduced around 2008 as far as I can remember. To produce ever-smaller but more powerful Behind The Ear type hearing aids, manufacturers moved the receiver (the speaker part) out of the body of the hearing aid and placed it at the end of a wire that went into the ear canal. Hence, receiver in canal or receiver in the ear.

The devices have become hugely popular both within the profession and with buyers because they are massively versatile, fitting many types of hearing losses and very discreet. In some cases, they are more discreet than in the ear hearing aids. They do however, have their pros and cons, let's take a deeper look at them.
THE PROS & CONS OF RIC HEARING AIDS

As with many things in life, there are pros and cons with RIC hearing aids, first, let's take a look at the advantages of RIC devices.

What Are The Advantages Of RIC Devices?

Discreet
They are highly discreet devices; although the body of the hearing aid sits behind the ear, they usually are very small and unobtrusive. Unless someone is actually checking they invariably go unnoticed.

The wire that leads from the body of the hearing aid into the ear canal is tiny and should sit along the crease of your face at the ear. Hence, it is almost unnoticeable as well. Because of these two facts, these are among the most discreet hearing aids available.

Easy Change Receivers
Because the receiver is easily interchangeable, these hearing aids can cover varied hearing losses from mild all the way through to severe to profound. It also means that if the receiver fails, which happens, it is easily changed out for a new one.

This means that the hearing aid does not have to go away for repair for a receiver change, it can be done instantly in the office if the hearing professional has spare receivers. This is a big plus, being without your hearing aid once you are used to wearing it is excruciating.

The pure joy of being able to hear well without massive levels of concentration and straining is only something you appreciate after you have a problem with your hearing aid.

What Are the Disadvantages of RIC Devices

Receiver Issues in RICs/RITEs
The fact that the receiver is placed in the canal or the ear is both a blessing and a curse. This placement exposes it to the hostile environment that the ear is for electronics. Your ear canal is wet warm and oily, all of the things that electronics tend not to like.

The manufacturers take great pains to protect the receivers with Nano coating materials, enclosed casings and wax guard protectors. However, unless you take good care of the receivers, changing your wax guards when you should, (you probably won't) inevitably wax gets into them.

At best, this can just block the sound outlet, at worst, the wax can ingress into the receiver itself and destroy it. Wax and moisture is the kiss of death for receivers.
Thankfully, the receivers are quickly replaced by your hearing professional; however, after the manufacturer’s warranty is up, you may have to pay for them.

While they vary in cost, they are not expensive, however, if you are replacing them regularly, the cost adds up. I don’t want to put you off this device types, they are exceptionally versatile, and I really like them. If you are recommended this type of device just be aware of the receiver issues.

Many of the hearing healthcare professionals we partner with can arrange a five-year manufacturer’s warranty to cover repairs. Some may charge, some may actually offer it for free.

If you are considering buying RICs, ask about an extended manufacturer’s warranty.

**Maybe Too Small!**
As I said, RICs / RITEs are tiny and discreet devices, usually the smaller they are, the smaller the battery they use. Both the size of the hearing aid and the size of the battery can cause difficulties for people with dexterity issues. The whole idea of acquiring hearing aids is so that you can wear them and enjoy the genuine benefits of hearing better.

If you have difficulty handling them to put them in, what should be a joy, can quickly turn into a frustrating task at best.

The same has to be said about the batteries, small batteries can be a nightmare for people with vision or dexterity issues. Many of the hearing aid manufacturers offer RIC / RITE hearing aids in a variety of sizes and battery sizes, for instance, Phonak offer the Audeo V range in a size 10 battery, a size 312 battery and a size 13 battery. The only caveat is the larger the battery, the bigger the hearing aid case.

**Contra-indications To Wearing RICs / RITEs**
Some people shouldn’t wear these type of devices. If you have permanent perforations in your ears or you have had a mastoid operation, these hearing devices aren’t really for you.

As you will know if you have these problems, there is an increased risk of middle ear infections and fluid release. Either will destroy the receivers of the hearing aids, because of the nature of your ears with these conditions receiver failures would be an ongoing problem rather than an occasional frustration. The same can be said for people who
suffer from wet ears or produce a large amount of earwax, either condition will cause issues for the receivers.

**In Finishing**

Great devices, they have their pros and cons, proper care will lead to fewer problems.
ITE In The Ear Hearing Aids
In The Ear or custom hearing aids are discreet and popular hearing aids for consumers, let's take a more in-depth look at them.

Custom Hearing Aids
ITE, CIC, IIC HEARING AIDS
Custom hearing aids or in the ear hearing aids come in many shapes and sizes, from quite visible Full Shell hearing aids to the so-called hidden hearing aids, the Invisible In Canal or IICs.

Custom hearing aids have been around for a very long time, as I said they come in many shapes and sizes that deliver different levels of power and functionality. They were hugely popular devices, but when RIC / RITE devices were introduced, their popularity waned somewhat.

With the introduction of the so-called "Invisible hearing aids" several years ago there has been a resurgence in their popularity. Hearing aid manufacturers are also overcoming some of the technical challenges that reduced the functionality of the very small custom device types in the recent past.

This has made the devices a better choice for people who need more help in tougher environments but want a very discreet package. Many of the manufacturers now offer
small wireless enabled completely in canal devices, which eliminates the traditional trade-off between discretion and functionality. Let’s talk about the types.

**Invisible Hearing Aids**

Invisible hearing aids or hidden hearing aids have been with us for a while, however, initially, they weren’t that hidden. That has changed dramatically. The manufacturers cracked the difficulties that precluded them from making truly invisible hearing aids.

Since then every manufacturer has introduced invisible in the canal hearing aid ranges. They fit deeply in the ear canal, and the faceplate cannot be seen easily. They are genuinely discreet hearing devices and have been well received. There are, of course, disadvantages, the IIC hearing aids are often too small to be wireless.

However, in the recent past, some of the manufacturers, Starkey, Siemens and Oticon in particular, have delivered wireless IIC devices, that’s wireless, not Bluetooth enabled.

For some, the trade-off between discretion and wireless functionality is an easy choice. They forgo wireless capability for the discretion; however, I believe there is a lot to be said for wireless capability. I think wireless accessories are outstanding solutions and used well they have changed the lives of hard of hearing people dramatically for the better.

But hey, that's just me. Invisible hearing aids are not suitable for everyone for several reasons, some reasons I will discuss later when talking about the overall pros and cons of custom hearing aids. However, there is one that is particular to invisible hearing aids, canal size and shape. If your canal is not the right shape or size, you are out of luck. Let’s answer a few questions about invisible hearing aids

**What are invisible hearing aids?**

Invisible hearing aids are deep fitting custom made hearing devices that sit deep within the ear canal. More often than not, the faceplate of the hearing aid cannot be seen. For this reason, they have been given the name invisible. The first manufacturer to introduce modern invisible hearing aids was Starkey, they introduced the SoundLens, and it began the race across all hearing device manufacturers to add their own version. Each and every manufacturer has now launched a hidden hearing aid option.

These hearing instrument types are called by different names by the various manufacturers, sound lens, Nano, IIC invisible in the canal or just plain invisible hearing
aids. No matter the official title, they all amount to pretty much the same thing, deep canal hearing aids.

The battleground has now extended as some of the device manufacturers have now introduced wireless invisible hearing devices. Something which up to now has been technically challenging. We would expect more of the hearing brands to begin offering wireless invisible instruments over the next year. Although this market is small, while you might expect everyone to want one, not everyone is suitable.

**Are invisible hearing devices suitable for everyone?**
The short answer is no, not at this time, while your hearing loss obviously needs to be taken into account, the major stumbling block to suitability is usually the size and shape of your ear canal. If your ear canal is either too small, too narrow or too awkward, you won't be suitable for these devices, it is as simple as that.

Even with advancements in technology, that will probably remain the case for a few years to come. The manufacturers simply need a finite amount of space to fit all of the components in, if your canal does not offer that space, you are out of luck.

**Are invisible hearing aids available on the NHS?**
This is a question that we get a lot; unfortunately, the answer is no. However, there are exceptionally discreet receiver in canal hearing aids available on the NHS.

**How much do invisible hearing aids cost?**
Generally, they are no more expensive than a different hearing aid type from the same technology level. In other words, you typically don't pay a premium for an invisible hearing aid. I say generally, because there always may be exceptions. For instance, the Phonak Virto B Titanium (which comes in an invisible version) is slightly more expensive than a similar traditional Virto B hearing aid at the minute.

**Invisible hearing aids with Bluetooth?**
Again, we get asked this quite a bit, the answer is yes but no, hahaha, let me explain. There are wireless invisible hearing aids, but no, they don't run on the Bluetooth connection. In the recent past, some of the hearing aid brands have released wireless invisible hearing aids.

They are wirelessly equipped, and they will connect to the manufacturer's audio streaming devices. I think this is a fantastic move forward because I believe wireless hearing aids were a fantastic innovation. Having said all of that, there are no Made For iPhone invisible hearing aids, there are no direct connection devices available right now.
**What type of hearing loss will invisible hearing aids work with?**
Generally, invisible hearing aids are suitable for moderate flattish type hearing losses. Those are usually the best types of hearing losses served by the devices. Let’s take a look at other hearing loss types.

**High-Frequency hearing loss and invisible hearing aids**
Generally, invisible hearing aids aren't suitable for people with high-frequency hearing loss. The problem is that they have a good low-frequency hearing, so putting a device into the ear canal causes intolerable occlusion. This can be by-passed by ensuring the invisible hearing aid fits into the bony part of the ear canal. In theory, this should stop any occlusion, however, getting the device that deep in the canal can be difficult, and it may be uncomfortable.

**Moderate hearing loss and IIC**
As I said, invisible hearing devices are ideal for flattish moderate hearing loss, there are no difficulties with occlusion, and the hearing aid output is perfect for this type of loss.

**Severe Hearing Loss and hidden hearing aids**
In general, most hearing aid professionals would not offer invisible hearing aids to someone with a severe hearing loss. They are not ideal because they don't provide much headroom, which simply means if the hearing loss gets much worse, the hearing aid is useless. However, there are invisible hearing aids suitable for severe hearing loss from Signia.

**Profound hearing Loss and Invisible in canal**
There are no invisible hearing aids that are currently suitable for someone who suffers from a profound hearing loss.

**The pros and cons of invisible hearing instruments**
They are similar in nature to most custom hearing aids, the positioning of them may well be optimal for hearing devices. That position deep in the canal allows the outer ear and ear canal to do its job, funnel sound naturally towards the eardrum. This is probably the most significant benefit of these types of devices. However, that positioning means that all of the electronics are open to the wax and moisture in the ear canal. This means that they need a lot of care and attention from the user. They also need dehumidifying regularly.

If you are prepared to take care of these hearing aids well, then I would say go ahead with them. However, you will need to take care of them to avoid electronics failures. As
I said, while there are wireless invisible hearing aids, generally speaking, most invisible hearing aids are non-wireless enabled.

**Completely In Canal Hearing Aids / Mini In Canal**

Completely in canal or CIC hearing aids are pretty discreet devices that will go unnoticed except by the keenest eye. Up to recently, they were predominantly non-wireless, however, in just the recent past, many manufacturers have released wireless-enabled CICs.

I think that this is a fantastic breakthrough; however, wireless-enabled devices are slightly bigger than non-wireless CICs, so you need to consider that before you go ahead if complete discretion is your objective. What is hugely interesting is that some manufacturers have managed to fit directional microphones on CICs, this again is a recent breakthrough.

Directional microphones give real assistance in noisy environments. However, this is the first time they have been on CICs, so it will be interesting to see the effect they have. Early reports indicate that they deliver better speech clarity in the group and noisy situations.

Again though, directional mics make the CIC slightly more substantial, I believe though, that like wireless, the functionality is well worth the trade-off. Mini in canal hearing aids are all of the above with the exception that they are slightly larger, most mini in canals would come with wireless functionality and directional microphones.

**Full Shell & Half Shell Hearing Aids**

They are as they sound, larger custom hearing aids that sit in the concha or bowl of the ear. The half-shell basically fills half the concha, and the full shell fills the whole concha. The traditional benefit of these devices has been more features, more power and physical controls like programme button and volume controls.

In the recent past, with the introduction of wireless capability and more powerful solutions at the CIC level, those benefits have all but become negated. However, these devices still have advantages, they usually have bigger battery sizes, which allow them to work longer between changes and they are easier to handle for people with dexterity and vision problems.
THE PROS & CONS OF CUSTOM HEARING AIDS

Yes, you guessed it, there are most definitely advantages and disadvantages to custom hearing aids. Let's take a more in-depth look at what they are.

What Are The Advantages Of Custom Hearing Devices?

Discreet
The smaller devices are highly discreet, and the invisible hearing aids are, in fact, invisible. The larger devices are of course not as discreet.

Easy To Handle
Because the devices are all in one unit, they can be easy to handle and to place in the ear, especially the larger hearing aids.

What Are The Disadvantages of Custom Hearing Devices?

Receiver Issues, Microphone Issues
Like RIC / RITE devices, the receiver is placed in the ear canal. However, it is better protected than the receivers in RICs. Again this placement exposes not just the receiver but all of the electronic components including the microphones to the hostile environment that the ear.

The manufacturers take great pains to protect both the receivers and the microphones. However, unless you take good care of your hearing aids, changing your wax guards when you should and cleaning the microphones, you are looking at possible failures.

Dirt and Wax, a Nightmare for Hearing Aids
At best, wax or dirt can just block the sound outlet or microphone inlet, at worst, it can make its way into the components itself and destroy them. As we said, wax and moisture is the kiss of death for electronics. The manufacturers have done a good job of protecting those sensitive components in most cases.

It is very rare for anything other than the microphone or receiver to fail, chipset failures are that rare that they are remarked upon with surprise.

In the case of custom hearing aids, if there is a failure, they will have to be sent off for repair, which can take a varying amount of time. If the fault is under warranty, it will be repaired free of charge, if not, you will have to pay a fee. If you are having them repaired regularly, the cost adds up.

Good Clean and Care
The key to success with these hearing aid types is an excellent clean and care routine that involves drying. The better you take care of these hearing aids, the better they will perform. Again, I don't want to put you off this device types, they are fantastic devices, and I really like them. If you are recommended this type of device just be aware of the inherent issues.

As we said, many of the hearing healthcare professionals we partner with can arrange a five-year manufacturer’s warranty to cover repairs. Some may charge, some may actually offer it for free. If you are considering buying custom hearing aids, ask about an extended manufacturer’s warranty.

Maybe Too Small!
Some of the custom hearing aids are very small and discreet devices, as with RIC / RITE devices, the smaller the device, the smaller the battery they use. With the smaller custom devices, the size of the hearing aid and the size of the battery can cause difficulties for people with dexterity issues. If you have trouble handling the hearing aids or putting the batteries in, what should be a joy can quickly turn into a frustrating task. The larger custom devices are easier to handle and use larger batteries that are easier to handle.

Contra-indications To Wearing Custom Hearing Aids
As with RICs and RITE devices, some people shouldn't wear these type of devices. It is pretty much the same as RICs if you have permanent perforations in your ears or you have had a mastoid operation these hearing devices aren't really for you.

The same can be said for people who suffer from wet ears or produce a large amount of earwax, either condition will cause issues for the hearing aids. Even though the power output has been significantly increased with this type of hearing aids, they still might not be suitable for your hearing loss.

If they aren't, don't let vanity win, get a hearing aid that is suitable for your hearing loss. That will translate into better hearing, which will help you lead a better life.

In Finishing
Again these are great devices. Generally, they are quite reliable, but they do need care and attention to ensure they keep on keeping on.
**BTE Behind The Ear Hearing Aids**
We love BTE hearing aids, probably the most reliable hearing devices you can buy.

**BTE HEARING AIDS**
Behind The Ear or BTE hearing aids have been around for a very long time. In the recent past, they have got smaller, more versatile and more powerful. Behind the ear hearing aids are self-contained units with all of the components in the case. Over recent years they have gotten much smaller than they once were. They are hugely versatile devices, and they will fit nearly every hearing loss.

Usually, the manufacturers will make different styles for differing losses, one for most losses from mild to severe and one usually labelled a superpower for profound hearing loss. Even the superpower devices have become quite small in comparison to the older styles. The hearing aid is connected to the ear through a coupling, in some cases, it is via a tube and ear mould, in the case of the hearing aids to the left it is with a thin tube and instant fit tip. The actual fittings are varied and usually based on hearing loss.
THE PROS & CONS OF BTE HEARING AIDS

We are finding it hard to think of disadvantages really, but we will give it the old college try. Let's take a look at what you can expect from BTE devices.

What Are The Advantages Of BTE Hearing Devices

Fully Functional Hearing Solutions
BTE hearing aids nearly always have a full load of hardware including volume controls, programme buttons and telecoils. The telecoil is a useful addition if you want access to loop systems in public buildings like churches, conference centres, and the post office.

In fact, many taxis in London are fitted with loop systems. Even though wireless communication systems in hearing aids are now the norm, the telecoil is still a good thing to have. The only issues that occur concerning it are how well the loop system is working or how well it has been fitted. This can affect audio quality.

Extremely Reliable Hearing Aids
BTE hearing aids are probably the most reliable of hearing aids, they very seldom fail. Because all of the components are encased in the hearing aid and the hearing aid is worn at the back of the ear, very little or no wax or moisture can get at them.

When something goes wrong with a BTE, it tends to be either the physical controls or the microphones. Nearly all of the manufacturers have introduced new types of microphone covers that almost completely enclose the microphones. So even microphone failure may be a thing of the past.

Easy To Use
BTE hearing aids tend to be easy to handle and place in the ear, so for people with dexterity or vision issues, they are a good choice.

What Are The Disadvantages of BTE Hearing Devices

Haven't a Clue
We are wracking our brains here and really can't think of anything, maybe discretion? Even that isn't really true, a small BTE with a thin tube is a very discreet hearing aid to wear. It would be almost as discreet as many of the RIC / RITE devices. Okay, the larger BTEs are not the most discreet, but personally, I would always go for long-term reliability every time. A hearing aid is of no use to you if it is broke and BTEs very rarely break.
Some people complain about BTEs and glasses, they get in the way of each other. I think that is probably a function of physiology. It depends on how much your ears stick out or don’t.

**Contra-indications To Wearing BTEs**

Sorry, again we are stuck for any here really.
Bluetooth / Made For iPhone Hearing Aids

Bluetooth hearing aids (Made For iPhone hearing aids are Bluetooth hearing aids) are direct connection devices. By that I mean they use some sort of onboard Bluetooth radio to connect directly to another device without the assistance of an intermediary streamer.

The device that they connect to can be an assistive listening device designed by the hearing aid manufacturer or an iPhone. The original LiNX from GN Resound was the very first Bluetooth hearing device to come onto the market. The category is generally known as Made For iPhone or direct connection hearing aids.

The LiNX was also designed to connect to GN Resound's Unite wireless accessories, which were designed to connect to phones, audio systems and TVs. What made them different from everything else at the time was that they could connect directly to an iPhone without any intermediary device. They were the very first to have this ability although they were followed quickly by the Halo from Starkey.

At the time of writing, every major hearing aid brand has released devices that will connect directly to iPhones without intermediary streamers. Many of the brands, such as Oticon and Signia, have released complete ranges of direct connection devices. This appears to be the way most of the brands are going.

The Problem with Bluetooth

All these hearing aids are pretty outstanding devices and the fact that they connect directly without an add-on is celebrated by many users. However, they have their issues. Generally, those issues are caused by Bluetooth. Although Bluetooth technology has gotten better, it is still a finicky technology which occasionally just does its own thing.

Like dropping the connection for no reason and then refusing to find the device it was just connected to. Believe me, I use Bluetooth every day for information transfer purposes, and it can be infuriating. It often works exceptionally well for weeks at a time and then it doesn't, for no apparent reason.

Unfortunately, the hearing aid manufacturers can't control this, it is just a function of Bluetooth. Again, I wouldn't let this hold you back, just be aware of the problem when you are making a decision.
**Made For Any Phone Hearing Aids**
In the recent past, Sonova (owns Phonak, Unitron) has introduced Made For Any phone hearing aids. These devices use the traditional Bluetooth headset protocol to connect to any mobile phone with a Bluetooth radio. In fact, they will pretty much connect to any device with a Bluetooth radio, including computers or even TVs.

**Hands-Free Calls**
The Sonova range of devices are the only hearing aids to provide hands-free calls. When your phone rings, you simply press a button on your hearing aid and chat away. No need to touch your phone.

**Stereo Streaming**
The Sonova devices also offer stereo streaming of media from your phone or connected device.

**Power Hungry**
The system is power hungry though, Sonova says that they have managed to reduce the battery drain to something akin to a typical Made For iPhone hearing aid. If you are buying these devices, go rechargeable or be prepared to change your batteries every couple of days.
Rechargeable Hearing Aids

Rechargeable hearing aids have been with us for a while; both Siemens and Hansaton have provided rechargeable hearing aids for many years. Up to recently, they have not been hugely popular. This has changed dramatically, let me first tell you why they weren't popular and then explain what will change that forever.

The main issue with the first rechargeable hearing aids was battery technology. The batteries simply could not be trusted to power modern hearing aids and the demands of streaming audio for a full day without interruption.

Not just that, the life of rechargeable batteries tended to be about a year. After that, they did not continue to hold their charge well and needed to be replaced. For most hearing aid providers, it made little sense to recommend them to prospective users. They were perceived to be a novelty and never gained traction.

What's Changed?
The battery technology has dramatically evolved, Phonak, quickly followed by Signia, introduced the first-ever rechargeable hearing aids powered by Lithium-ion batteries. Lithium-ion as a power source is more capable and a far better option for hearing aid use.

The Lithium-ion technology delivers a full 24 hours of use on a single three-hour charge. The use time changes when you include streaming audio time, so if you use your hearing aids like wireless headphones for music, TV or phone connection, you should still get 16 hours of use.

Lithium-ion is also capable of far more charge-recharge cycles. However, initially, there was some worry that the power pack might only offer peak performance for three to four years. Which meant that the power pack would need to be changed during the lifetime of the hearing aids. That worry has receded somewhat because several of the brands have undertaken accelerated cycle testing that appears to show the power packs will deliver up to six years before changing them needs to be considered.

Initially, only two brands introduced Lithium-Ion powered rechargeable hearing aids. The rest of the brands introduced Silver-Zinc powered rechargeable hearing aids powered by the Z-Power system. That has changed though, nearly every brand has now changed to lithium-ion as a power source. There are pros and cons to both systems, and I will talk about them a bit later.
Why does this change everything?
Probably most importantly, consumers want it, in fact, they want it badly. If you are an experienced user you will probably know what I mean, if you aren't, let me explain. Most experienced users have a giant size pain in their arse (Irish technical term) with disposable hearing aid batteries. They are fiddly, easy to drop and generally irritating, not just that they are also an ongoing cost.

Generally, the cost is negligible; however, they are still an ongoing cost that many users resent. There is also the whole hassle of making sure you have spare batteries wherever you go. Sounds easy right? Nahhhhh, as most people will tell you, the day they forgot to pack their extra batteries was the day the hearing aids run out unexpectedly.

So, we have a congruence of two states of being, Hearing aid providers are more likely to recommend rechargeable hearing aids and the market, in general, will be exceptionally receptive to them.

Why Should You Consider Rechargeable Hearing Aids?
There are many reasons why you should consider buying rechargeable hearing aids, and I would like to set them out here. Generally, rechargeable hearing aid options are no more, or little more expensive than the models that use traditional hearing aid batteries, so the cost of adoption is negligible.

Ease of Use
Rechargeable hearing aids offer real ease of use to you, no fiddling around with little batteries every few days. The size of hearing aid batteries, and in fact, hearing aids themselves, can be irritating and troubling to users, especially if they have eyesight or dexterity issues.

Just removing the disposable battery from the packaging can be a mini nightmare for some people, let alone opening the battery compartment and getting the damn battery in there! So, if you have decreased dexterity or a condition that numb the fingertips, such as arthritis, diabetic neuropathy, and Parkinson’s disease.

Well then, rechargeable hearing aids are most definitely for you. Rechargeable hearing aids are simply put into the charger at night, and in the morning, they are ready for use. More than that, you don't need to remember to buy batteries, you don't need to
remember to carry spares, you never run out and generally your battery won't let you down at the very worst moment.

**Good for The World**
Rechargeable batteries are far greener and better for the environment than disposable hearing aid batteries. If you use the silver-zinc rechargeable batteries, you will need to replace them once a year, during a five-year time-frame, you will need 8 batteries. During the same period, you will need, on average, 520 disposable batteries.

The lithium-ion powerpack will probably need to be replaced after six years. The thing is though, you might actually be in the market for new hearing aids after six years. So, you may actually never replace it. They will still have enough life to act as your spare pair when needed.

**Cost-Neutral**
If you need to replace your rechargeable silver-zinc batteries, it will cost you on average maybe €50. So basically, apart from utility costs (electricity), a year's worth of rechargeable bliss is around fifty quid with silver-zinc. If you shop very carefully, you could probably buy a year's worth of disposable batteries for around the same price.

The lithium-ion power packs will probably cost the price of a standard repair. That varies from place to place, but in Ireland, it is around €180. So, for two, it will be €360. Again, six years of traditional at the very best price of €50 a year is close to that, really close.

So, the cost is probably relatively neutral. For those people who don't shop for their hearing aid batteries online, rechargeable batteries are probably a far cheaper option.

**Probably only BTE and RIC for the moment**
At present, it appears that this new renaissance of rechargeable will only be available in BTE and RIC models. Making custom hearing aids rechargeable is a complex operation; generally speaking, it would not be difficult to make a large custom hearing aid rechargeable (such as a full shell ITE). However, making a small ITE like a CIC rechargeable would be pretty complicated.

**Phonak Rechargeable**
Phonak kick-started this new movement with the introduction of their Audeo B-R or Belong-Rechargeable. The device is a Receiver in Canal device, and it is available in their top three levels of technology. Interestingly they didn't offer it in their lowest entry-level
range. The device can handle several levels of receiver, so it covers hearing losses from mild to profound.

They say that no matter the level of the receiver, the device will last for twenty-four hours between charges with up to eighty minutes streaming of audio wirelessly. That is pretty impressive. Apparently, they have found in field trials that the devices will last for up to fifteen hours with five hours of streaming, which is pretty much a full day for most users. That would mean that you would get quite a bit of answering your mobile and watching the television in as well.

The devices will run for six hours after a thirty-minute charge, and a full charge takes three hours in total. They quickly followed up with the introduction of their Bolero B P-R, which is a BTE powered by the same rechargeable power pack. They offer the same stats for it.

**Audeo Marvel**
The new Audeo Marvel range from Phonak offers two rechargeable Receiver In Canal hearing aids. One without a telecoil, which is available right now, and one without a telecoil, which will be available late 2019.

The Marvel rechargeables are available in every level of Phonak technology, and because the initial ones are RICs, they will cover every hearing loss from mild to severe to profound.

**Signia Rechargeable Hearing Aids**
Signia quickly joined the fray with the introduction of their Cellion Primax devices. Again, these are Receiver in Canal devices, and again, they can take many levels of receivers. Signia introduced the Cellion in all its levels of technology. They say that the Cellion devices will last 24 hours with limitless streaming. That is exceptionally impressive if it proves true (no reason to doubt them!)

**Signia Nx range**
Signia quickly followed up the Cellion with the introduction of a variety of rechargeable hearing aids on the Nx platform. They now offer three rechargeable RICs, the Pure Charge N Go, the Styletto and the Styletto Connect, and a rechargeable BTE, the Motion Charge N Go.

Signia say that you will be able to stream up to five hours per day and still benefit from 17 hours of battery life before needing to recharge with the Motion and Pure. The
Styletto Connect devices will deliver 16 hours of use with five hours of streaming. That's pretty good streaming time and battery life. The Styletto is a non-Bluetooth enabled aid and will deliver a full day of use on one charge.

**Oticon Rechargeable Digital Hearing Aids**
Oticon was a little late to the party with their Rechargeable hearing aids offer. Oticon originally went down the route of the Z Power Silver Zinc technology with their Opn range. However, they had quite a few problems with the silver-zinc systems, and they have now introduced a lithium-ion powered hearing aid on the Opn S range.

**Resound Rechargeable Digital Hearing Aids**
Resound introduced their rechargeable hearing aids in August 2017. They initially went down the route of using the Z Power Silver-Zinc battery technology. Like Oticon, they have now gone to lithium-ion powered devices in their new Quattro range.

**Starkey Rechargeable Digital Hearing Aids**
Starkey also initially went for Z Power for their rechargeable hearing aids. They have also now introduced lithium-ion powered rechargeable hearing aids.

**Unitron Rechargeable Digital Hearing Aids**
Unitron quickly followed their stablemate Phonak (both owned by Sonova) with their own rechargeable hearing aids. However, unlike Phonak, they went for the Z Powered Silver-Zinc option. They first introduced a Receiver In Canal rechargeable option but have since followed with a Behind The Ear Option. With the launch of their new Discovery platform, they have gone with lithium-ion.

**Widex Rechargeable Digital Hearing Aids**
Widex were practically the last to the party with rechargeable hearing aids. They have been working on Fuel Cell technology for many years, and it will change the powering of hearing aids forever.
I say without hesitation that fuel cell technology is a paradigm shift, and I am excited to see it introduced in 2019. For now, they have introduced a Z Power system for their popular Beyond and in their new Evoke hearing aids.

**What Are The Pros and Cons of Rechargeable Hearing Aids?**

Some people have warned people off rechargeable hearing aids for different reasons, I think they are exceptionally beneficial, but there are pros and cons, let’s talk about the types and what they have to offer.

Rechargeable hearing aids have been around for a long time. However, there were never very popular because of the power output. ZPower has coined the phrase one-charge-per-day standard, and it is a pretty good phrase (I wish I came up with it). In essence, the traditional rechargeable hearing aids did not meet the one-charge-per-day-standard. The power supply problem only got worse when hearing aids became wireless and more users were streaming audio.

**A New Generation of Rechargeable!**

A new generation of rechargeable battery technologies has arrived, and it promises to make life easier for consumers. Lithium-ion and Silver-Zinc, both of these technologies, offer something different with different pros and cons, but the one thing they both offer is, the one-charge-per-day-standard. Unfortunately, the silver-zinc technology has had a lot of problems and most hearing aid brands have moved away from it.

**Lithium-ion Rechargeable hearing aids**

Most of the hearing aid brands now offer Lithium-ion rechargeable hearing aids. In the case of Phonak, the power pack is a sealed, integrated system. Signia have delivered something similar, but different. The systems offer pros for safety and cons for the use case. Let me explain, Lithium-ion can be a fire risk if the battery is damaged, sealing the battery in the body of the hearing aid means that it is protected from mishandling.

However, sealing it in the case also means that it cannot be replaced by the user. Lithium-ion can be expected to deliver for between four and five years, so that means the battery pack will have to be replaced after four or five years because it will not be providing what it should.
The hearing aids will have to be sent back to the factory, and it will also have a cost attached. From what I know, Phonak at least has said that they will replace battery packs in the future as a standard repair, which means it won’t be a ridiculous cost.

As I said, Signia has done it differently, their power pack is a sealed unit. However, they have designed the outer case to ensure that the power pack can be replaced in the office as opposed to the factory.

The Cons of Lithium-Ion Rechargeable Hearing Aids

- **Safety**: Lithium-ion is a poison, and hearing aids are small enough to swallow, presenting a hazard to children and pets. Lithium-ion has the potential to go on fire if damaged badly enough.

- **Sealed Case**: The fire hazard of the tech dictates that the lithium-ion battery is integrated into a sealed case. If it runs out of power while still in use, the hearing aid cannot run on a standard disposable battery but must be taken out of commission while it recharges. And when a lithium-ion battery reaches the end of its life, it can’t be replaced by the user but must be swapped out by the manufacturer (Phonak devices) or the professional (Signia Devices).

- **Power Limitations**: If you stream a lot of audio (from an MP3 player or mobile phone, etc.), there’s a possibility the batteries may not last the full 24-hour day. In fact, Phonak seem to think that if you stream up to about five hours, the aids will last 14 to 16 hours. This shouldn’t affect most people, though since 12-16 hours would be a typical day of hearing aid use.

- **Larger Footprint**: The footprint of Lithium-Ion is bigger than the other option, which means bigger hearing aids.

The Pros of Lithium-Ion Rechargeable Hearing Aids

- **No more fiddly battery changes**: The technology ensures that you no longer have to worry about the expense of disposable hearing aid batteries, nor do you have to worry about changing them.

- **24 hours of continuous use**: The technology has finally reached the one-charge-per-day standard. You should be able to get up to 24 hours use with up to 5 hours streaming.
- **Easy charging**: Simply drop it in your charger, no hassle.

**Silver-Zinc Systems**

The producer of Silver-Zinc rechargeable hearing aid systems is ZPower. Initially, ZPower offered a retrofit system which consisted of individually designed battery compartments and chargers for many popular hearing aid models. This allowed hearing aid users to change their current products to rechargeable hearing aids.

However, in partnership with hearing aid brands, there are they have brought several Silver-Zinc powered rechargeable hearing aid options to market. Unfortunately, there have been a huge amount of problems with the silver-zinc systems and most of the brands have moved towards lithium-ion. Like the lithium-ion systems, they provide power for a full day of use.

These systems are not integrated and sealed into the product, in fact, these systems are a little more forgiving than the Lithium-ion systems. If for some reason you don't get to charge your hearing aid, you can simply slip in a disposable battery. Silver-Zinc is also more stable than Lithium-Ion; it won't explode into flame when damaged.

**The Cons of Silver-Zinc Rechargeable Hearing Aids**

- **Once a Year Replacement**: Silver-Zinc batteries need to be replaced once a year. This represents a cost to you. However, they are cheap enough, so the cost over four or five years probably balances out with the repair cost of changing a Lithium-Ion power pack.

- **Power Limitations**: This is less of a problem with Silver-Zinc because they are much more power-dense. However, if you stream a lot of audio (from an MP3 player or mobile phone, etc.), there’s a slight possibility the batteries may not last the full 24-hour day.

**The Pros of Silver-Zinc Rechargeable Hearing Aids**

- **No more fiddly battery changes**: The technology ensures that you no longer have to worry about the expense of disposable hearing aid batteries, nor do you have to worry about replacing them except for once a year.
• **24 hours of continuous use:** This technology is also one-charge-per-day standard. You should be able to get up to 24 hours use with up to **5 hours streaming.**

• **Flexibility:** Because they are removable, the rechargeable batteries can be easily replaced by standard disposable hearing aid batteries in the event of an emergency. The hearing aids can run on the disposables until they can be recharged at night. It also means that when it comes time to replace them, you can do it at home.

• **Safety:** Silver-zinc is non-flammable, non-toxic and 100% recyclable.

• **Smaller footprint:** Higher energy density means a silver-zinc battery can come in a smaller package than comparable lithium-ion rechargeable batteries. This simply means smaller hearing aids.

• **Backwards Compatible:** The technology is backwards compatible, and it can be added as an aftermarket system.

As you can see, there is a lot to think about when it comes to rechargeable hearing aids, not least what type is right for you. Each system has its pros and cons, and I don't think you should be afraid of them. As always, we just think you should have all the knowledge you need to make an educated decision.
Hearing Aid Technology Levels
Hearing aid technology levels can be confusing at best, why is one better than the other? Here is what you need to know.

LET'S TALK HEARING AID TECHNOLOGY
Once upon a time, there were three hearing aid technology levels, which were known in the profession as low end, mid-range and high end. Then most of the hearing aid manufacturers introduced four, loosely they are called, basic, standard, advanced and premium and that is the designations I will use here for clarity.

The Life of Hearing Aid Technology
We hear many times that a hearing aid has a life of about five years, that isn't really quite true. What is meant by that is, hearing aid technology moves forward every five years. Hearing aids themselves can last for over a decade with care and attention.

So if you buy one today, you may still be wearing it in ten or twelve years, the available hearing aid technology will have changed dramatically twice in that time. Doesn't mean that there is anything wrong with your hearing aid, it just means that there are things that are radically better available.

Let's take a look at those levels and what you can expect from them in general. Every couple of years a hearing aid manufacturer releases a new product range, once it was every four years, but it seems to have accelerated to almost every two years in the recent past.

For clarity purposes, a product range may be referred to as a chipset, a platform or a family by differing people within the profession. Each new product range will have four levels of technology.

We said that there used to be three technology levels in hearing aids, but that had changed, we kind of feel what the manufacturers have done in most cases is actually split the mid-range into two levels. A lower mid-range which is what we are calling standard and a higher mid-range, which is what we are calling advanced.
Usually within each technology level, there will be every hearing aid type that they produce. For instance, Widex has introduced its new product range the Evoke, the Evoke product range is based on the new Evoke chipset, and it has four levels of technology, the 440 which is top of the range or premium technology, the 330, the 220 and the 110 which is the basic level of technology.

Each of those Widex technology levels has a full family of hearing aids, including custom, BTE and RICs. Nearly every manufacturer offers hearing aid products in this manner, some use different names to mark different technology levels, but most use some sort of name and numeral combination. Phonak like to confuse everyone by giving their hearing aid types different names, but at least they stick to the numeral using the number 90 for their premium top of the range devices, 70, 50 and finally 30 for their basic level.

**How Hearing Aids Work**

Before we launch into the different levels of technology, let's talk quickly about what hearing aids are. Hearing aids have changed dramatically over the last few decades with the advent of digital technology. At their core, hearing aids have always been made of the same four basic parts: a microphone, a processor, a receiver (the speaker), and a power source (the battery).

In simple terms, the microphone picks up the sounds and passes it to the processor. The processor enhances the signal following its programming and delivers it to the receiver, which provides the amplified signal to the ear canal.

The power source delivers the power needed to make the magic happen. The introduction of digital technology transformed hearing aids allowing manufacturers to introduce ever more powerful processors in smaller packages. In modern hearing aids, the signal picked up by the microphone is converted from analogue to digital before being processed, this allows for a much deeper manipulation and enhancement of the sound.

This manipulation is how noise reduction and other hearing aid features work. The signal is then converted back from digital to analogue before the receiver delivers the enhanced signal into the ear canal. It is nearly impossible to get an analogue hearing aid now, virtually all of the hearing aids manufactured in the world are now digital. Okay, let's take a look at what the tech levels are and more importantly, what they can do for you.
Basic technology hearing aids

Each manufacturer has a basic level of technology, they may not call it exactly that, but for clarity that is the label, it is getting. This level of technology is designed to work for people who are relatively sedentary (don't get out much).

As I have said, this might be the basic level, but it will still be on the latest chipset available from the manufacturer. Basic level hearing aids are usually just that, quite basic, they will have features such as directional microphones and maybe even some noise reduction, more on both later, but generally they will be basic, and they will be manually controlled.

However, that is beginning to change, Phonak has just introduced its latest Venture platform and the basic hearing aid technology the V30 is an automatic hearing aid. It is limited to only two sound situations, but that is an exciting development none the less.

Other manufacturers will follow suit in their next generation of hearing aids. This is just like an arms race when one does it, the others have to follow suit.

Lifestyle help from basic hearing aid technology

You can expect basic technology to help you in less complex sound situations. That means that you can expect to hear well in one to one conversations, even if the person is talking to you from another room (within reason, if you own a thirty bedroom mansion, all bets are off). You can also expect them to help you with small groups, family around the kitchen table, for instance.

They should also help you with TV and Radio, although both can be a little difficult because of the quality of audio from different stations. Depending on the car you drive, this level of technology should also help you with understanding conversation in the car.

Well programmed basic hearing aids will help you somewhat with limited noise. If you take the time to learn coping strategies like turning your back to the noise and seating yourself in a way that minimises exposure to the noise. However, once the noise level rises, they will begin to let you down.

This is where our love of wireless accessories comes in, if you use a remote microphone accessory with a basic level of hearing aids, it will really help you in noise. It will give you that extra bit of help you need to hear your companion, it will also open up other
opportunities to hear better in different situations. In the car, you simply hand the remote mic to your passenger, and you will be able to hear them quite clearly. Having issues with the TV? Put your remote mic down by the speaker, or use the cable that comes with it to plug into the audio out of the TV. By no means is it a replacement for higher technology hearing aids, but when you are working on a budget, it can give you the extra edge you need.

**Standard technology hearing aids**

Again, each manufacturer has a standard level of technology, which is second from the bottom. These devices are aimed at people who are a little more active. The features in these hearing aids will be slightly better than the basic features and are designed to help you hear in somewhat more challenging sound situations.

This level of technology is designed for someone more active in their life. This level of technology has dramatically improved over the years, to give you an idea, the current hearing aids at this level would easily be as good as flagship models from five years ago.

**Lifestyle help from standard hearing aid technology**

You can expect all of the support that a basic hearing aid would deliver but better, and on top of that, you can expect assistance in group situations, small meetings, out and about at the shops and in restaurants.

Again, this is based on the noise levels present, this level isn't going to help you to hear well in a very noisy restaurant on a Saturday night, think moderate levels of background noise in most situations.

Again, wireless hearing aid accessories can make up for any difficulties in different situations, and you should also consider them. We believe they are worth the extra expense in most cases.

**Advanced technology hearing aids**

This level of technology is ideal for active people delivering excellent sound quality and speech clarity in most situations they will find themselves in. This level of technology has dramatically improved in the last few years; it seems that most of the
manufacturers are keeping a lot of their top-end technology features in the advanced ranges.

They are dumbing them down slightly, but not much, it has been interesting to watch, especially over the last year. For instance, the Widex 330 is almost as good as the 440 range, and the Phonak V70 is nearly as good as the V90 range. There are clear differences between them, and there are valid reasons why you would choose the higher-end technology, but they are close nonetheless.

The main differences between this level and the next up are the binaural processing of hearing aid features. Put simply, hearing aids work exceptionally well when they make decisions as a pair, this extends to the features involved in delivering better hearing.

In the flagship models of all brands, most of the features are applied by the hearing aids in a combined and consolidated manner because of the communication between both hearing aids.

This really does deliver the best and most natural sound and clarity. Advanced technology level hearing aids may have most of the top-end features, but they don't work together in that combined way. Nevertheless, they are exceptional hearing aids generally.

**Lifestyle help from advanced hearing aid technology**

Again, you can expect all of the help you get from the two previous levels of hearing technology but better. Advanced hearing aid technology can be expected to assist you in even complex sound situations, especially if you use coping strategies well.

Usually, at this level, you can expect real help with hearing better in situations like large auditoriums, open plan buildings like churches. You should be able to hear quite well at the theatre, music should be a far better experience.

In general, speech clarity in noisier situations should be pretty good. So if you are an active individual who likes to socialise, goes to some meetings and gets out and about to social events, these may well be the hearing aids for you. We know we are boring you with our obsession with wireless accessories, but hey good honest advice remember? Yes, wireless accessories that are chosen with the situations you really want to hear in mind will help you even more.
**Premium level hearing aids**

This level of technology is where hearing aid manufacturers deliver all of their very latest features. This level of technology is for people who simply have to hear well in almost every situation. They are designed to handle the most complex sound situations and deliver the best speech clarity and most natural sound.

In this level, the hearing aids will genuinely work as a pair, deciding on how the sound is processed to deliver the very best hearing possible. The decision-making process and the application of the hearing aid features are undertaken in a binaural manner, and because it uses the power of two separate processors, these are always the most powerful hearing aids available (in computing power).

**Lifestyle help from premium hearing aids**

Pretty much what you would expect, everything that the rest can do but exceptionally better. Premium hearing aid technology is designed to deliver the very best possible hearing and speech clarity in even complex sound situations.

These type of devices are designed for active people who need to hear well everywhere. Remember though, even at this level of technology you will not be delivered super hearing, hearing aids are designed to give you the best experience with your residual level of hearing.

They are not designed to, nor can they give you back your normal hearing or better than normal hearing. Oh, and yes, wireless accessories are still an option worth thinking about even at this level.
Hearing Aid Features

Let's Talk Hearing Aid Features

Technology levels and hearing aid features are linked, the better the technology level, the better the feature that is used. The feature set of any hearing aid is dependent on the level of technology of the hearing aid and the manufacturer.

The flagship or highest technology hearing aids from each manufacturer have the best feature set available from them. First of all, when we speak about features in the profession, we are usually not talking about physical features but hearing aid algorithms or mini programmes that run on the processor.

The easiest way to understand is to compare it to a smartphone, a smartphone runs on an overall system like Google's Android or Apple's IOS, however, within that system, there are apps available to you that do different jobs.

Hearing aids and their features are not unlike that concept. Many people get a little snowed under when they try to understand features, and we can understand that. Modern digital hearing aids have a ridiculous amount of different features that are designed to deliver different levels of benefit to hearing aid users.

All modern hearing aids will have some mixture of different level of features, so we are going to try and investigate them and tell you in plain language what they actually do. Please forgive me in advance, I am a nerd, and this stuff excites me.

What are the real-world benefits of hearing aid features?

As I discuss the hearing aid features, I will try and translate them into real-world benefits for you. Just explaining what they are and what they do is simply not enough. So without further blah, let's have a look.

Audible indicators in hearing aids

Right at the basics, an audible indicator informs you of some sort of change in the hearing aids you are wearing. For instance, if you change the programme, or if the volume control has changed or that your battery is running low.
In most hearing aids, these tones are usually a beep or melody type sound. Widex are one of the only manufacturers that employ real speech to announce the programme that you are on and whether your battery is low.

They have even made this feature available in many world languages. This is a clear indication of why Widex is a little different to everyone else, they think clearly about the little details that would help.

They are one of the very few manufacturers to use this feature, and it is available across their range of hearing aids no matter what the technology level.

**What are the advantages for you?**

Audible indicators allow you to know what is happening in your hearing aids at any one time, for instance, you enter your favourite restaurant, and it is busy. You know that your hearing health professional has set up programme two for just this very situation, so you switch your hearing aids to it.

You hear the two audible beeps, or if you are wearing a Widex it announces the programme name, and you know immediately you are at the right settings. It is still a bit loud though, so you turn down the volume a bit, the sound of the descending beeps let you know it is working. Simply put, audible indicators allow you confidence that you are using the hearing aid properly.

**Listening programmes in hearing aids**

Many hearing aid manufacturers offer listening programmes in their hearing aids. What they are is a differing number of pre-set listening situations that are programmed into hearing aids. Each listening programme has its settings optimised for different listening conditions/sound environments.

The different listening programmes can then be selected by the user using a switch or push button on the hearing instrument or via a remote control. The listening conditions are usually set as speech, speech in noise, music and acoustic telephone.

**What’s the advantage to you?**

Apart from the obvious one of offering better hearing in differing situations, there are other advantages. For instance, your hearing healthcare professional can make adjustments for just one situation in isolation without making global changes to how the hearing aids work.
This means that they can target changes to help you hear better in the situation you are having a problem with, without affecting the working of the hearing aids in other conditions where you are doing fine. In essence, the more programmes, the better the customisation of the hearing aid for you in different situations.

For a real-world instance, you leave the house in the morning with the children in the back of the car, so you change the listening programme to the one that focuses to the back so you can hear them clearly, all though in fairness after you did it, you wish you hadn't!

After dropping them off you have to meet your friend in the coffee shop, the shop is busy so you use the programme that has been set up for noisy environments so you can hear her clearly. You are thrilled you did because she has some great news to share with you and you can hear it clearly. That is the benefit of listening programmes.

**Automatic programmes in hearing aids**

Many manufacturers offer different levels of automatic programmes, what they do is automatically select the optimum instrument settings without the user having to push a button or use a switch. The management systems of the hearing instruments analyse and identify the current sound environment.

The management system decided what the best set of parameters for you to hear better in that sound situation and then automatically switches the parameters within the hearing aids to the appropriate settings. The amount of automatic programmes on any hearing aid is dependent on the manufacturer and the technology level.

**What's the advantage to you?**

Automatic programmes deliver real advantages, in essence, the hearing aids are always working to provide the best possible sound quality no matter where you are. They do so seamlessly and without any input from you, which means you can just concentrate on getting on with your life.

In most manufacturers’ hearing aids, these automatic programmes can also be individually altered or fine-tuned for your preference. Most hearing aid manufacturers would also offer manual listening programmes alongside their automatic function. Again this delivers the benefit that your professional can provide the exact customised settings you need for just one situation.
**Binaural synchronisation**

Binaural synchronisation is something that has only recently entered the lexicon of hearing aid terms with the advent of wireless communication between hearing aids. In essence, it means that the hearing aids communicate wirelessly to ensure that the settings are synchronised.

**What’s the advantage to you?**

It is a hugely useful feature that was introduced several years ago. At its most basic, this feature ensures that the current user settings are synchronised across the two hearing aids. So if you make a change in one hearing aid, such as the changing the listening programme or volume control setting by touching the button. It is automatically switched on the other to reflect this. This means that the two devices are always in the same programme and at the same volume level.

However, it is at its most advanced where it dramatically improves the lives of hearing aid users. Binaural synchronisation at its most advanced makes sure that every feature of the hearing aid is working in a combined manner to deliver the very best listening experience.

This really is exciting stuff (god that was so geeky!) because it is responsible for the enormous advances in hearing aids in the last few years. It is also the reason why hearing aids have become more natural sounding (told you I was a nerd). When someone speaks about this technology to you, be sure to be clear precisely what it synchronises across the two hearing aids.

**Binaural Compression**

Again the advent of this feature was enabled because of the advances in wireless communication in hearing aids. Widex was first to introduce it in their flagship Clear hearing aids in 2009. Most of the manufacturers have followed suit in more recent times introducing the feature under differing names.

Hearing aids that use binaural compression work as a combined system to deliver enhanced sound as natural as possible. This is achieved by using both hearing aids to assess the surrounding sound environment. This information is then shared between and used by the hearing aids in a combined manner. This mass of information allows the hearing aids to make decisions on sound output as an actual pair or system.

**What’s the advantage to you?**
The system uses natural sound cues such as temporal effects (time differences in sound) and the head shadow effect (differences in sound from one ear to the other) to assess what is going on in the sound environment. It then reproduces those sound cues in the enhanced sound you receive to deliver the most natural sound experience.

All of this happens instantaneously without time lag. Because the natural sound cues are preserved, your brain gets the optimum information possible so that it can do, what it does naturally. Remember, the ears just carry sound, it is the brain that makes sense of what you are actually hearing.

I really think that this is the most exciting feature that has been released in recent times. As this feature evolves, it will make hearing aids better and better, achieving benefits for most users that were unimaginable even a few short years ago.

**Compression channels**

Compression channels have kind of fallen out of favour in the recent past as a sexy talked about feature because of two reasons. The first is that they are actually hard to explain without resorting to gobbledygook and the second being that sexier more understandable features have come about.

However, they are still fantastic features, and it is worth me trying to explain what they are. Okay, this is pretty technical stuff, but I will give it a go-to make it intelligible.

Compression channels are designed to change how different frequencies of sound are amplified. Compression channels are divided into several channels that are used to restrict or alter differing levels of amplification within one sound frequency.

For instance, you may have problems hearing sounds below 40dB in one channel. However, the amount of amplification we need to deliver to you to hear those sounds clearly is radically different from the amount of amplification that we may have to add to a sound of 65 dB. Compression channels allow us to add varying levels of amplification to the varying volume of sounds.

The feature is used to instruct the hearing aid to amplify or reduce the range of noises that you hear. This feature simply allows us to customise the hearing aids to your hearing loss in a better manner. Some hearing aids have more channels/bands than others.

**What’s the advantage to you?**
Simply a better-customised hearing aid, which is the foundation that everything else relies upon.

**Data logging**

Data logging is a feature which records different sets of information during the hearing aid's use. Most hearing aid manufacturers offer data logging of one type or other with differing levels of data captured. This information is available to be analysed by the hearing professional when they connect to the hearing aids. This type of information allows a professional a deeper understanding of your experiences.

**What’s the advantage to you?**

It can assist in the fine-tuning of the aid to your preferences. The data recorded includes the hours of use, the types of listening environments you were in, the listening programmes you used and any volume control changes during that period.

Data logging delivers information that helps the hearing professional to programme the hearing aid to your specific requirements. Anything that allows the programming of your hearing aids to better suit you has to be seen as a good thing.

**Feedback cancellation in hearing aids**

Feedback is the horrible whistling that is most associated with older hearing aids and used to be one of the biggest complaints of hearing aid users. Feedback is caused by amplified sound being re-processed, in other words, the sound emitted from the receiver (speaker) is re-processed through the hearing aids, and it shrieks. This is precisely the same thing that happens when a microphone is put too close to a speaker.

The underlying cause of the feedback is the escape of sound from the ear canal. There are many reasons for that, it can be due to poor fitting of an ear mould or in-ear hearing aid, which allows amplified sound to escape.

Earwax blockage is another frequent culprit for hearing aid feedback. Another cause of the feedback is the close proximity of the hearing aids to something, for instance, if you place anything over your ear, a hand or hat or a person hugging you.

Feedback cancellation is a feature that identifies and stops feedback, how it does it changes from manufacturer to manufacturer and within technology levels. Suffice to say, each feature identifies the feedback and which frequency or frequencies it is occurring in.
It then removes the feedback from the signal and stops the whistling. Different features do this in different ways, I won't bore you with the technical details, but if you really want to know, drop us a line, and we can explain.

**What's the advantage to you?**
Simply put, your hearing aid doesn't whistle, you don't get embarrassed, and your hearing aids work better.

**Adaptive feedback cancellation**
This is feedback cancellation on steroids, it can adapt its speed of operation to improve its performance automatically, and for example, it can change how it works when you are using a telephone, listening to music and suddenly hear alarm beeps.

The telephone needs strong feedback cancellation, the music situation needs very little feedback cancellation because musical notes can sound like feedback and alarm beeps is a similar concept.

**Directional microphones**
Directional microphones completely changed how hearing aid users can hear in noise. Directional microphone features use the sound information supplied by two microphones, to allow the computer brain of the hearing aid to identify the sound that is coming from the rear and sound that is coming from the front.

This allows the processor to reduce the level of sound coming from the rear and concentrate on the sound coming from the front. Modern directional microphone features actually enable you to change the direction of hearing as you require. You can change the focus of the hearing aids from all-around sound to being more focused on a single person or object to the front side or rear.

**What's the advantage to you?**
Simply put, directional microphones are a proven method for hearing well in noise. So they are an invaluable feature for you to have.

**Adaptive directional microphones**
Yes, you guessed it, directional microphones on steroids! This feature allows the null of the directional microphones to adapt, the null is where the noise source is. So the
microphones detect the location of the strongest noise source and adjust the sound to reduce your perception of that noise.

If the noise source moves, the system adapts to keep that noise source reduced. Most of the modern adaptive systems work in more than one frequency band, meaning that they can help to reduce your perception of several different noises at one time, even if they are all moving at different positions once they are at differing frequencies.

**What is the advantage to you?**
Bigger, better-proven method to help you hear in noisy environments!

**Automatic directional microphones**
This is a feature that just automates the directional microphones completely, it allows the processor to select how it will use the directional microphones according to the sound situation you are in. In a quiet situation, they will operate in an Omni-directional mode (taking in sound from all around) and directional mode or adaptive directional mode if available when a noise source is introduced.

**What's the benefit to you?**
Complete automation of what is an outstanding feature, you get to hear well in every situation without any input. It just happens automatically. Each manufacturer has its own flavour of directionality, where possible we will always explain what it is clearly on our website.

**Frequency bands in hearing aids**
Again, like compression bands or channels, this one is a little bit in-depth. Frequencies, as we will discuss them here, are the way that sound is split. The total frequency range of a hearing instrument is divided into several bands or channels in which the gain that is provided can be customised to your hearing loss.

A quick but worthwhile side note here, the frequency bandwidth of hearing aids can be very different. What that means is that the number of sound frequencies that a hearing aid can process can be very different from manufacturer to manufacturer.

Some hearing aids can only process sound frequencies between 200 Hz and 6 kHz; others can process between 100 Hz to 11.5 kHz. Why is this important? I hear you ask, while human speech is generally between 200 Hz and 4 to 6 kHz, for the full and rich
enjoyment of music, a much wider bandwidth is more desirable. Hence, if you are an audiophile, you might well appreciate the wider bandwidth.

Back to frequency bands, each manufacturer is different, some hearing aid manufacturers call them bands and some call them channels and some manufacturers offer more than others. The bands allow your professional to programme the hearing aid in a more customised way for your hearing loss. The more frequency bands that the aid has, the finer the programme can be, so you end up with crisper, clearer hearing.

Most features of hearing aids work within the bands, so the more bands there are in the instrument, the more bands that the features in the hearing aid work across. How many bands are best? There is a lot of debate about that, but it is generally agreed that any amount between fifteen and twenty is optimal, that's why you will find most flagship hearing aids have numbers of channels or bands in that range.

For instance, Widex flagship hearing aids have fifteen channels. However, GN Resound hearing aids have seventeen channels.

**What's the advantage to you?**
The more frequency channels or bands hearing aids have, the better, although after twenty the benefit starts to fade. The more channels or bands, the better the customisation and the better experience that other hearing aid features will supply. Simply meaning that you will receive optimal benefit from your hearing aids.

**Hearing aid noise reduction**
This is probably the feature that drives most interest, it is often discussed as a feature that makes speech clearer in noise. Generally, it actually doesn't quite do that exactly. Only one manufacturer, Widex, have actually ever produced a noise reduction feature that affects the signal to noise ratio.

Signal to noise ratio or SNR to geeks like me is used to measure the ratio of signal (speech) to noise. So the real measure of any feature that helps you to understand speech should be SNR. What most noise reduction features actually do is to reduce the amplification of non-speech sounds to allow a better understanding of speech sounds.

This tactic makes it more comfortable for a user in noisy conditions by reducing the background noise, for example in traffic noise in the street, a busy pub or restaurant. There is a lot of evidence that this reduces fatigue, reduces the amount of concentration you have to have and therefore, actually does help you hear speech a little clearer.
As with all features, not all noise reduction is the same, and the more high-end technology has better strategies to deal with noise.

**What's the advantage for you?**
A better chance for you to understand speech in noisier environments, in combination with a good directional microphone system it will dramatically improve your experience.

**Speech enhancement**
Speech enhancement is another feature designed to help you hear speech clearly in noise. It is used in combination with noise reduction to better help you to hear those vital speech sounds. The processor in the hearing aids identifies speech signals and enhances or amplifies them. It analyses sound signals and, where most noisy maximises the speech signal.

**What's the advantage for you?**
In combination with noise reduction and directional microphones, it allows you the best opportunity to hear speech in noisy sound situations.

**Transient noise reduction**
This is simply a noise reduction feature that concentrates on identifying and suppressing impact or sudden sounds, such as shutting doors, clattering dishes and glass breaking. The feature is designed to do it without affecting the speech clarity. It is known by many names across different hearing aid manufacturers.

No matter what it is called, it allows the hearing aid to process sudden or loud noises in a more comfortable way for the user.

**What's the benefit for you?**
A much more comfortable listening experience for you as you go about your daily life.

**Wind noise reduction**
It is exactly what it sounds like, it is a noise reduction system that reduces the sound of wind cavitation on the hearing aid microphones. This feature is particularly useful for people who like to be in the outdoors. So if you are a golfer or a hiker, it is something that you should consider.

**What's the benefit for you?**
It will make it much easier for you to tolerate being outdoors if you are an outdoorsy type, golf and such things, it is an invaluable feature.

I think this covers the most obvious features available, as I said, different manufacturers call the features different things. But at their core, they are the features that I have discussed here. If I have missed something that you would like to know about, drop us a line on Hearing Aid Know, and we will answer your questions.
Over the Counter Hearing Aids

I spoke about this on Hearing Aid Know last year, but I think it is worth covering here. I believe that Over The Counter hearing aids will become a bigger feature of the hard of hearing world over the next few years. There has been growing speculation concerning Over the Counter (OTC) hearing aids being made legal in the United States, and finally in 2017, instructions were passed to the FDA to regulate for such devices.

The PCAST (PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY) Report about hearing technology in October 2015 recommended a significant change to the laws governing the supply and provision of hearing aids. One of the recommendations it made was about the hearing aid medical waiver. This has now happened, what does it mean for OTC hearing aids and more importantly, what will it mean for consumers? Let's look at the background.

A Greedy Monopoly

For many years hearing aid advocate organisations in the States have been calling for changes to the rules governing hearing aid provision. The main reason for these calls has been the assumption that the high price of hearing aids has been the main block to adoption of them by the multitude of people who need them. I personally don't necessarily subscribe to that argument, I know that cost is an issue, however, I don't feel it is the general impediment that it has been painted to be.

In this debate, both the manufacturers of hearing aids and the providers of hearing aids have been painted as greedy and supporting a monopoly. Unfortunately, some of the hearing provider’s representative organisations have not helped themselves with ridiculous paternalistic statements that seem to have been purposefully designed to irritate people.

Are We Greedy?

I know I am not; I would have to say the bulk of people who I know within the profession are not either. I charge for my time and service, and then I deliver that time and service as I am sure many others do. The focus in this debate has been on the hearing aid as a product, it has not been on how that product is delivered and maintained. The problem though is that no matter what I say, it just looks like I am defending a monopoly.

On the 7th of December, the FDA issued the “Immediately in Effect Guidance Document: Conditions for Sale for Air-Conduction Hearing Aids,” which effectively ends
federal enforcement of the hearing aid medical waiver. What does that mean for the consumer? The hearing aid medical waiver is a waiver that may be signed instead of having the required pre-hearing-aid-purchase medical evaluation. The wording of the original federal regulation can be seen here (21CFR801.421). In essence, it removes the need for a customer over the age of eighteen to get a medical evaluation of their hearing before deciding on hearing aids.

The FDA announcement does not change any rules regarding over-the-counter (OTC) hearing aids, but it did address them. “FDA does intend to consider and address those recommendations in the future as appropriate, including those regarding a regulatory framework for hearing aids that can be sold directly OTC to consumers, without the requirement for consultation with a credentialed dispenser. FDA intends to solicit additional public input from stakeholders before adopting such an approach”.

In the press release “the FDA Commissioner Robert Califf, M.D. was quoted as saying "Today’s actions are an example of the FDA considering flexible approaches to regulation that encourage innovation in areas of rapid scientific progress. The guidance will support consumer access to most hearing aids while the FDA takes the steps necessary to propose to modify our regulations to create a category of OTC hearing aids that could help many Americans improve their quality of life through better hearing.” I think that was taken as a clear sign that with time, OTC hearing aids will become a reality.

For many years I have spoken with hearing aid advocates around the world, advocates like Steve my co-author Hearing Aid Know. Nearly all of them have been demanding more power over their hearing aids, the ability to make fine tuning changes themselves. I have always supported that idea, why shouldn’t we make their hearing care inclusive? One thing that has always struck me during these conversations is that what they called for was inclusion in the process, not the exclusion of the professional. Even the most strident and independent of Advocates want the ability to consult with a professional.

Would it surprise you to find out that I would support this type of hearing devices? Because I would.

You may find it surprising, but I think these types of devices are a good thing, not a bad thing. However, they will only be a good thing if specific criteria are met. The devices will need to be fitted to your loss in some way, so there needs to be some way of testing your needs either built into the device or accompanying the device. Any testing procedure needs to be able to flag referable conditions, this is imperative.
In my career, I have identified four people with cancer through a hearing test. I, of course, did not make that diagnosis; I simply undertook the hearing test and referred them for further investigation because I was deeply unhappy with the results. Four people who went on to have lifesaving treatment because of a hearing test.

Hearing loss is more often than not run of the mill hearing loss; however, sometimes it is not. Sometimes it is a sign of some underlying nefarious condition that needs treatment. This is what scares other people and me within the profession. However, good technology can probably ensure that it is not an issue. I think it is incumbent upon the FDA and any other regulatory body to ensure some sort of strong regulations are in place concerning this.

**What will it Mean For You**

When the new legislation is brought forward to legalise the sale of OTC hearing aids, it will mean that you can go to your local point of sale and buy an OTC hearing aid just like you would purchase any electronic device. You will then have to work out how to fit it and use it flying solo as it were. I think that this type of solution will not be a fit for everyone, and I don’t believe the devices will be any better than very basic hearing aids.

**Not for Everyone**

Even within the traditional hearing aid manufacturers, there has been a push towards giving users more control over the hearing devices. However, not every user is interested in having the power, in fact, many want something that they put on and never have to think about.

OTC devices will be ideal for some and not for others. There was a recent small-scale study on the efficacy of self-fitted hearing aids that I reported on. The conclusions were fascinating, although the study was small, it has added some weight to the call for further study. Its conclusions were as follows

"While limited, the data suggest that self-fitting aids may provide satisfactory benefit and performance to those who can manage the self-fitting process. Our findings show that at least one currently available self-fitting product is comparable to those measured with professionally dispensed hearing aids."
What they said, in essence, was that when people were "able to manage" it seemed that self-fitting may not be a bad thing. By able to manage, they meant technically aware and capable, people who were au fait or familiar with technology.

In this context, I think that OTC hearing aids will be very similar, they will be ideal for people who can manage them. However, they might not be suitable for everyone. I believe they will be similar in concept to many of the hearing aids that are already offered as internet sales.

The Freedom to Mess it up
These devices will also give you the freedom to make a mess of your hearing, this is another factor that the FDA needs to consider. It needs to ensure that you can't make your hearing worse through the use of these devices. Again, I think technology can help here, but it is an issue that needs to be raised. In essence, for these devices to be safe to use, users will need some education about making them safe to use.

I have talked to others within the business for some time about adopting low-cost devices that were sold on an over the counter type basis. I would adopt these types of devices, I would insist that I did a workup on your hearing or you had a workup done by someone I trust (this is to protect both you and me). I would then sell you the device for you to do with it what you wanted.

If you want support or help other than warranty issue, I will charge you for it. I think that is fair, my time is worth money, you would not expect to attend any other professional for consultation for free, so why would you expect to do so with me? I think that this may well be the future model; I don't think the traditional model will die quite yet, I think this new model will probably run in tandem with the conventional model.

What about Traditional Manufacturers?
What will the traditional hearing aid manufacturers do when OTC comes to pass? I don't know, I can't speak for them, but I think they will have to re-assess their own ideas about provision channels. I don't and would not hold that against them, it is just the way of the world and of business.

I know some of them wouldn't be eager to become involved. However, business is like an arms race, when one-ups the game, the others must do so to survive. As well as that,
many of the hearing aid manufacturers are public companies, their management teams will need to make decisions based on their shareholders best interests.

It would be my feeling that they will take a watching brief on the market and then decide to enter it.

**What Will Be Your Experience?**

I think that really depends on who makes the devices, hearing aids are a specialist electronic device. Hearing aid manufacturers are producing useful devices based on years of experience and research and design. New entrants to the market don't necessarily have that experience or the algorithms that make everything work.

A hearing aid is not just a simple amplifier; it does so much more than amplify sound. So it will be interesting to see what the first OTC hearing aids are like. If the traditional manufacturers become involved in this market, it will mean that there will be some pretty good devices available.

**Care of the Devices**

Any buyer of these types of devices will have to actually take care of them, any vendor of the device will have to consider the failure of the receiver. It is pretty simple, earwax and moisture kill receivers (the speaker part) and any seller of the devices will have to be aware of that.

At the moment, traditional hearing aid manufacturers accept when your negligence (and that is often what it is) kills one of their receivers during the warranty period. They simply replace them, even when they are gummed up with ear wax.

How will that work with over the counter hearing aids? Will they continue to replace the receiver even when you have been responsible for its failure? I mean at the moment, the hearing aid manufacturers don't actually have to, but they do it. What will OTC manufacturers do?

**Making the Right Choice**

I try to be very careful about the recommendation I make, I try to take into account lifestyle, personal and ear canal conditions. For instance, if you are active, able, and a bit tech-smart, I will easily consider a RIC device or a custom hearing aid device for you. I
would base that on the fact that you can easily take care of the device, ensuring that it is maintained so that the receiver won't fail.

If however, I think that the maintenance of the hearing aid may be a problem, or if in fact, the ear canal is just too hostile (excess ear wax or moisture) I would nearly always recommend a BTE. As a purchaser of an OTC device, how are you to make the decision on that, if you make the wrong decision, what are you going to do?

**Freedom**

It is evident that there are a lot of questions to answer, however I think that OTC hearing aids will bring freedom of choice, I think that can be a good thing and a bad thing. I don't think consumers are stupid, generally, well most of them. I believe that delivering freedom of choice will allow people to adopt amplification earlier. Will enable them to test the water as it were, to understand what amplification can provide to their life. That has to be a good thing.
Clean and Care of Hearing Aids

Hearing aids are small, electronic devices that operate in conditions that are both warm and damp. Conditions that most electronics don't like. After making a significant investment in being able to hear better, it makes a lot of sense for you to keep them in the best shape possible by cleaning and maintaining them at home.

The hearing aid manufacturers make great efforts to ensure your hearing aid will keep on keeping on. However, if you don't do your part, those hearing aids will fail. In many cases, a failure may well end up needing to be sent away for repair.

This could leave you without your hearing aid for up to two weeks, depending on how busy the repair centres are. This is a major hassle, in my experience, people who have become used to better hearing with their hearing aids hate to be without them. It really upsets them, so the key is to maintain your hearing aids as much as possible to avoid any hassle.

Avoid hearing aid repairs

Hearing aids do fail, it is a fact of life, electronic components can fail, and they certainly will with age and constant use. But you can take steps to avoid that failure for as long as possible. Those steps should be incorporated into a good daily clean and care routine.

Most of the time, I was in Practice, the failures I saw were a receiver (loudspeaker part) or microphone failures. It was exceptionally rare to see anything else within a hearing aid fail. Both of these components are the most exposed in every hearing aid.

They are the components that need daily attention. Some hearing aid types are more prone to possible failure than others. For instance, in the ear hearing aids and receiver in the canal hearing aids have a higher failure rate than behind the ear hearing aids.

Hearing Aid Care and Maintenance

So let's get to the meat, how you can best take care of your aids, I will discuss each type of aid and each step that needs to be made. If I miss anything, let me know. Likewise, if you have some excellent tips yourself, don't hesitate to contact us. Before we move on here is some quick tips for hearing aid nirvana:

Follow a daily routine
Clean the hearing aids giving attention to the receivers and microphones

Dry out your hearing aids

Quick tip:

Never use alcohol, solvents or cleaning agents on your hearing aids. Special care products for cleaning like hearing aid wipes and sprays are available and should be used.

Cleaning of hearing aids and cleaning tools

You should clean your hearing aid every day, every manufacturer supplies a cleaning kit with their hearing aids.

It will usually include a wax brush, a wax pick and a cloth. These tools are designed to help you care for your aids and using them properly will help to keep your hearing aids going.

Hearing aid manufacturers have also designed filters to protect receivers in the case of RIC and ITE hearing aids.

You will also get at least one pack of these with your hearing aids. Use Them, the proper use of wax filters (sometimes called wax caps) will protect your receiver and keep it going longer.

Quick Tip:

Earwax & moisture kills hearing aids, wax guards are there for a reason, use them!

The most significant cause of failure is wax and moisture getting into the receivers or the microphones of hearing aids. If you change your wax guards when they need to be changed you can avoid much of this problem.

When do wax guards need to be changed?

I am sorry, but the honest answer is how long is a piece of string? Each person is different, I have seen Patients who only needed to replace their wax guards once every six months, I have seen other Patients that needed to change them every month.
It depends on wax production in the ear canal. Generally, as a rule of thumb, if your wax guard is full of wax that doesn't fall out when brushed, it is time to replace it. If you don't, that wax will eventually make it into the sound tube and then the receiver.

Cleaning and maintenance of an ITE and RIC hearing aid

ITE hearing aids, in particular, need daily attention, as do RIC hearing aids. The reason for this is that the receiver lives in the ear in both devices. As I said earlier, these devices are equipped with wax guards that you need to pay special attention to. So let's break down the steps you need to take and when you should take them:

Quick tip:

Many people try to clean their aid at the end of the day, I always recommended doing it in the morning after drying it overnight. That way the wax is dry and easier to remove.

1. Place your hearing aids in a drying device at the end of the day, this will allow moisture to be removed from both the electronics and any wax or debris gathered on the aid.
2. The next morning, have a good look at the microphone inlets and the receiver end of the hearing aids. Get yourself a magnifying glass if you need to for this. The details and placement of these areas will be in your owner's manual or your hearing professional will show you.
3. Concentrate on cleaning the receiver and microphone ports using the soft-bristle brush that came with the cleaning kit. When you do it in the morning, the wax should be dried out and easy to move, especially after drying out overnight.
4. To clean off built-up wax, hold the hearing aid and gently clean the openings with the wax brush. The dried debris should be loose enough to be cleaned away.
5. If there is still wax in the ports that have not been dislodged, you can use your wax pick (again, usually included in your cleaning kit) to clear more stubborn deposits out of the ports. Be careful here, don't jab the pick in, just use it gently.
6. Check your battery compartment and the battery contacts for wax or debris, if there is any brush it off.
7. Finish by wiping the entire hearing aid with the cloth provided. This will remove leftover debris from the hearing aid.
8. Assess your wax guard, if it looks like it needs changing, change it out. If you change your wax guard when needed, it will go a long way towards reducing failures.
9. Lastly, give your hearing aids a good visual once-over, with ITEs, check the casing and any joins for any signs of cracks or issues. With RIC devices check the receiver wire, make sure there are no kinks or twists that may lead to the failure of the wire.

10. **Cleaning & Maintenance of BTE hearing aids**

BTE hearing aids are much harder to kill. However, you still need to clean and maintain them. Drying them is as essential as it is for ITE and RIC aids. The maintenance is similar but different. So let's break down the steps you need to take and when you should take them:

Quick tip:

Drying is as important for BTEs as any other hearing aid, especially the tubes.

1. Place your hearing aids in a drying device at the end of the day, this will allow moisture to be removed from both the electronics and any wax or debris gathered on the aid.
2. Occasionally when needed, remove the ear mould and tube (if you have one) from the hook and clean it with soapy water. If your BTE has a thin tube, remove the thin tube and use the supplied wire (like a hair-thin pipe cleaner) to push through the tube. This will remove any debris.
3. Use an air blower to force water out of the tube and then place the tubing in the drying kit with your hearing aid to dry overnight.
4. The next morning, have a good look at the microphone inlets of the hearing aids. Again a magnifying glass can be helpful. The details and placement of these areas will be in your owner's manual or your hearing professional will show you.
5. Concentrate on cleaning around the microphone ports and any other user controls like programme buttons or volume controls. Use the soft-bristle brush that came with the cleaning kit. Again, doing this in the morning is the ideal time, the wax should be dried out and easy to move, especially after drying out overnight.
6. To clean off built-up wax, hold the hearing aid and gently clean it with the wax brush. The dried debris should be loose enough to be cleaned away.
7. If there is still wax in the ports that hasn't been dislodged, you can use your wax pick (again, usually included in your cleaning kit) to clear more stubborn deposits. Be careful here, don't jab the pick in, just use it gently.
8. Check your battery compartment and the battery contacts for wax or debris, if there is any brush it off.
9. Finish by wiping the entire hearing aid with the cloth provided. This will remove leftover debris from the hearing aids.
10. Lastly, give your hearing aids a good visual once-over, check the casing and any joins for any signs of cracks or issues.

11. **Drying out hearing aids**

I have spoken several times about drying out your hearing aids in this section, I should explain the process and what you can use to do it.

**Hearing aid dryers**

Hearing aid drying equipment comes in all shapes and sizes from the very cheap to moderately expensive.

It is one of the single most important investments you will make if you buy a hearing aid. Moisture build-up in hearing aids cause real issues and failures, and it is generally easy to avoid.

**Hearing aid drying cups and tablets**

Probably the most straightforward and cheapest form of hearing aid drying available but still very effective. It is simply a jar/cup with a sealable lid to which you drop a drying tablet. Every night you screw the lid off, drop your hearing aids in and seal it.

The tablets are designed to suck moisture out of the air and your hearing aids. In the morning, take your hearing aids out (don't forget to seal the lid again) and voila, dry hearing aids. It is a simple process, easy to do and will save you real money in repair costs, so why wouldn't you do it?

**Electronic hearing aid dryers**

Yes, you guessed it, hearing aid dryers you plugin. They come with different functionality, some will still use drying tablets or bricks, and some don't. Some will dry your hearing aids and disinfect them using UV light, some won't. Many of them are designed to be portable, so you can bring them with you on trips.
Widex introduced a drying station late last year; they call it the Dry N Go. It is a portable electronic drying and disinfecting station. You can see it to the right. There are several available on the market though.

If you follow a good clean and care routine, your hearing aids will function better for longer. Hearing aid repairs are expensive enough, so take care to avoid them with some simple maintenance.
In Finishing
I like helping people; it is actually one of my things. Don't think this is just some selfless, altruistic streak. There is some of that involved, but I really get a buzz knowing I helped someone. So it isn't exactly unselfish.

I would ask you to do me a great favour, if you have found this book to be of real use to you, I would ask you to give it a favourable review where you have bought it. Your reviews are valuable; they give the next person looking for information the confidence to buy the book.

I have covered much here, and I hope I have made it clear and easy to read, however, if I have not, or if you are looking for more information, don't hesitate to contact us with your questions on Hearing Aid Know.