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updated

Hearing Aid

Buying Guide

2021

The **2021 Hearing Aid Buying Guide** is a valuable resource for consumers who are considering purchasing hearing aids. Although audiology is a highly specialised field, every day more and more Australians are seeking hearing services. This trend is set to continue with the relative prevalence of hearing loss increasing with Australia's aging population. It is therefore not surprising that and ever-increasing number of hearing aid providers are opening their doors. In fact, over the last couple of years we have seen major optical chains start to sell budget hearing aids.

How to ensure quality service and avoid paying too much for hearing aids?

If you are considering getting your first set of hearing aids or perhaps upgrading your current hearing aids, this guide will assist you in ensuring you get the most appropriate hearing aids for your individual needs and lifestyle without spending a fortune.

The guide aims to provide practical information to assist you in selecting:

Hearing aids with technology that meets individual needs

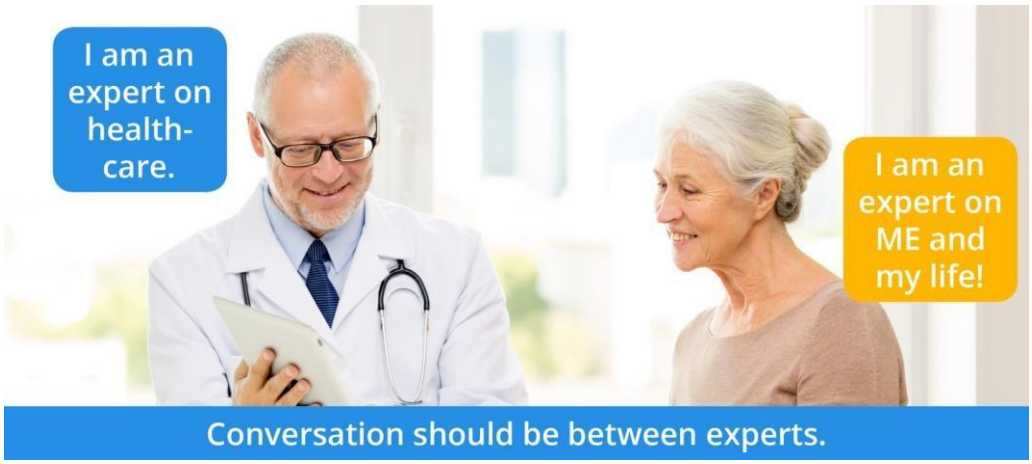
Experienced and qualified hearing service providers

Hearing aids that represent good value for money

Why develop this guide?

This guide was developed by a group of independent audiologists that are passionate about audiology and achieving great outcomes for clients.

Central to our philosophy is that we believe that great outcomes are only achieved when the client can make educated decisions about their hearing health after considering their individual preferences, needs and values.



Currently, the Australian hearing aid industry is structured in a way that tends to benefit providers more than consumers. Although being fitted with hearing aids is a benefit for most clients, often clients are not getting the best hearing aids for their individual needs and they are often paying more than they should.

Approximately 90% of hearing clinics in Australia are either owned by a hearing aid manufacturer or part of a corporate chain which deals with only a limited number of manufacturers. The implication of this for the consumer is that they may not be getting the best technology, as clinicians do not have access to all available technology. In addition, these corporate entities are often set-up to provide incentives to push the more profitable product lines, blurring the line between care provider and salesperson. In fact, in March 2017, the Australian Competition & Consumer Commission (ACCC) released a report “Issues around the sale of hearing aids” to encourage the industry to reconsider commissions, disclosure and sales practices in the context of the Australian Consumer Law.

https://www.accc.gov.au/media-release/hearing-aid-sector-put-on-notice

The Structure of the Guide

The guide is structured in four easy-to-read sections and includes a summary section of important tips

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Important points are highlighted by a yellow lightbulb.

1. Hearing Loss and its Impact

"Sight connects us to things, hearing connects us to people"

This famous quote above by Helen Keller highlights the importance of hearing and our relationships with other people.

Hearing loss is very common. In fact, 1 in 6 Australians have a significant hearing loss. However, it should not be considered a minor inconvenience that can be easily dismissed. Ignoring hearing loss can have far reaching consequences. Although its occurrence is insidious, often developing gradually over time, it has significant consequences for the hearing impaired. The impact of hearing loss is not simply frustration over the TV volume and asking people to repeat themselves. For many people the psycho-social implications of hearing loss are significant - people start to withdraw and avoid social situations, increasing isolation and risk of emotional problems.

Hearing loss can impact a person in three main ways:

Social Withdrawal

Social withdrawal due to difficulties communicating with others

Emotional Problems

Emotional problems caused by reduced self-esteem and confidence

Fewer Opportunities

Fewer educational and job opportunities due to impaired communication

Recent studies have also shown that hearing loss is correlated with depression (Zhang et al., 2014) and cognitive decline (Lin et al., 2013).

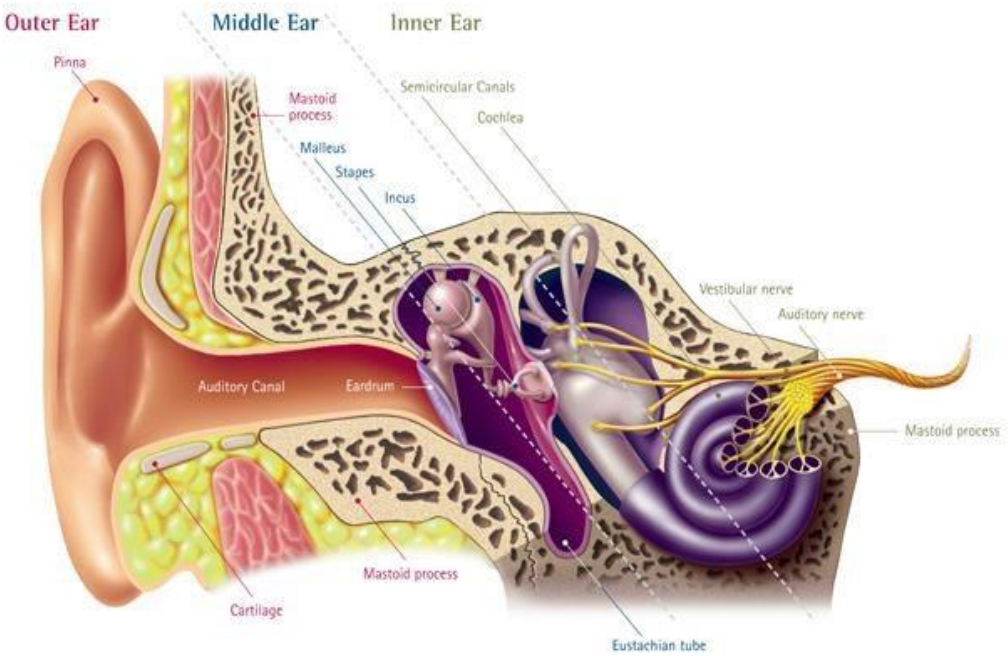
Li C, Zhang X, Hoffman HJ, Cotch M, Themann CL, Wilson M. Hearing Impairment Associated with Depression in US Adults, National Health and Nutrition Examination Survey 2005-2010. JAMA Otolaryngol Head Neck Surg. 2014;():. doi:10.1001/jamaoto.2014.42.

Lin, F. R., Yaffe, K., Xia, J., Xue, Q.L., Harris, T.B., Purchase-Heizner, E., Simonsick, E.M. (2013). Hearing Loss and cognitive decline in older adults. JAMA internal medicine, 173(4), 293-299.

Hearing loss is not only a problem for the hearing-impaired individual, but also for their family, friends and workmates. Hearing loss can create frustration for everyone in their personal and professional community or can have a negative impact on the home environment, potentially leading to conflict. If the television is too loud, one family member may have to choose to tolerate it or leave the room.

1.1. Types of hearing loss

Hearing loss can occur in several different areas: outer ear, middle ear or inner ear. In fact, where hearing loss occurs describes the type of hearing loss. Hearing loss is grouped into two main types, depending on which system is affected – conductive and sensorineural. A mixed hearing loss is where both types are present.



Conductive Hearing Loss

Conductive hearing loss is caused by obstructions or malfunctions in the outer or middle ear, impeding the mechanical transfer of sound to the inner ear.

Conductive hearing loss can be caused by blockages (such as impacted ear wax) or by disorders that stop the middle ear's ability to transfer sound (such as middle ear infections) malfunctions or damaged ear drums. This kind of damage results in lowered sound intensity (loudness) as the sound that reaches the inner ear is less intense and is at a lower volume than the original.

However, the ear generally works in a normal way, if the original sound is loud enough to overcome the limits of the blockage.

Identifying and treating the cause of conductive hearing loss can result in a partial or complete improvement in hearing, with the use of hearing aids and devices to correct any remaining hearing loss.

Sensorineural Hearing Loss

Sensorineural hearing loss is caused by damage to the inner ear or auditory nerve and can be split into two parts. The 'sensory' part refers to damage to the hair cells or inner ear fluids. The 'neural' part refers to damage or degeneration of the nerves that transmit sound signals.

Sensori-neural hearing loss can be caused by exposure to loud noise, diseases such as meningitis and the aging process. Supplementary tests, in addition to complete audiometric assessment, would identify whether it is the nerves or inner ear that are affected. This kind of hearing loss is usually considered to be permanent and irreversible. In addition to reduced sound intensity, there is an element of distortion so sounds seem unclear, even if they are loud enough.

Sensori-neural hearing loss does not usually respond well to medical treatment, so the main goal of intervention is the use of hearing aids to provide amplification.

Mixed Hearing Loss

Mixed hearing loss is a combination of the above types with conductive factor compounding a likely irreversible sensorineural hearing loss. The conductive loss may be responsive to treatment (such as clearing obstructions or treating a middle ear infection), but some degree of hearing loss is most likely to remain permanently. Hearing aids can be beneficial once the conductive aspect has been identified and treated.

1.2. Signs of hearing loss

Hearing loss generally develops slowly over many years. Often friends and relatives are the first ones to notice.

Common signs of hearing loss include:

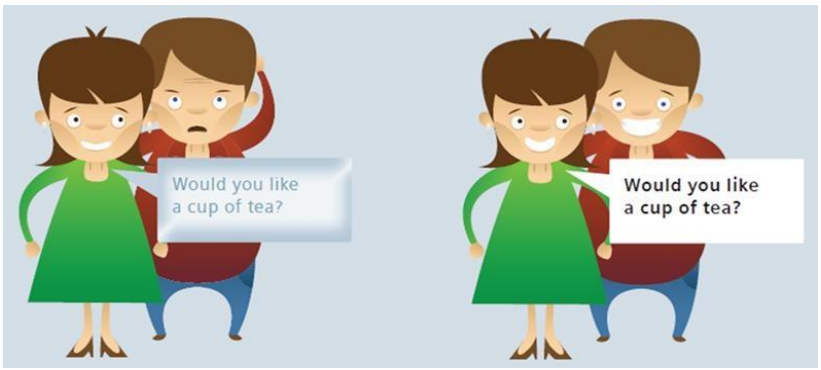
- People appear to mumble
- Having to ask people to repeat themselves
- Difficulty hearing high pitched sounds (e.g. birds, children's voices, music)
- Difficulty following conversation in noisy environments e.g. restaurants
- Going out less due to difficulty in following conversations
- Requests from others to turn down TV or radio volume
- Difficulty hearing on the phone

If any of these signs are noted an appointment with an audiologist should be booked as soon as possible for a hearing test. The audiologist will conduct a comprehensive hearing test and then give advice on the best course of action.

Key Point 1 – Hearing loss should not be considered a minor ailment. It can have significantly impact well-being - symptoms of hearing loss should be checked as soon as possible

2. Getting Hearing Aids

Hearing loss should not be endured – properly fitted hearing aids can provide tremendous benefits and reconnect wearers to the world of sound. First and foremost, there will be improved hearing. Using hearing aids regularly ensures what other people say becomes much easier to hear. Hearing aids do not restore hearing to normal, but improve it significantly. Many sounds not heard for a long time, such as birds singing, doorbells ringing, will become audible again.



Hearing aids usually improve the user's social, psychological and physical sense of well-being.

Studies show that people who wear hearing aids:

Maintain better family relationships

Have more self-confidence

Experience more independence and security

Key Point 2 – Modern hearing aids that are properly fitted have been shown to not only improve the hearing of wearers, but to also improve their psycho-social wellbeing.

2.1. Choosing a hearing aid provider

Hearing loss is generally not a short-term ailment. The chronic and permanent nature of most hearing loss means that it is likely to be a life-long experience. In fact, in most cases, hearing will gradually decline over time due to ageing. Therefore, the relationship with a hearing services provider is likely to be a long-term one, with annual visits for hearing tests and hearing aid finetuning. It is therefore important to find a provider that is competent, trustworthy and has a genuine desire to help you. In selecting a provider, look for the following things:

Qualifications, certification and experience

To ensure competent, quality support it is important to be seen by a qualified audiologist with at least five years' experience and who is clinically certified* to see government clients (via the Commonwealth Hearing Services Program). In Australia, there is no regulation on who can fit hearing aids to private clients. In fact, anybody can start to fit hearing aids and see private clients without any significant prior training, education or registration. However, although there is no regulation for seeing private clients, there is significant regulation required to see government clients. Approved providers to the Commonwealth Hearing Services Program are either an audiologist or audiometrist and require high levels of clinical certification and significant clinical experience.

- Audiologists complete a Masters degree in Audiology which is accredited by the Audiological Society of Australia.
- Audiometrists study through non-University (e.g. TAFE).

*maintains a Government Hearing Services provider number

Independent

Independent audiologists own and operate their own clinics, rather than working for large chain corporations. This sets independent audiologists apart from the majority (80%) of hearing clinics in Australia who are either owned or strategically aligned with a hearing aid manufacturer selling their own brands of hearing aids.

Independent audiologists have the freedom to give clients the time and attention to deliver highly professional and personalised services tailored to every aspect of their needs. In addition, independent audiologists provide continuity of service – most likely clients will see the same qualified audiologist at every visit over many years, rather than a random provider who is assigned their case on a day.

Independent audiologists provide clients with up-to-date information and advice on the best available hearing aid technology for their individual needs and budget across all established brands and models.

Transparent pricing

The hearing aid industry has a poor reputation of over-charging customers with unscrupulous providers relying on clients' limited hearing aid knowledge and their reluctance to shop around. Fortunately, more and more clients are requesting quotes and shopping around.

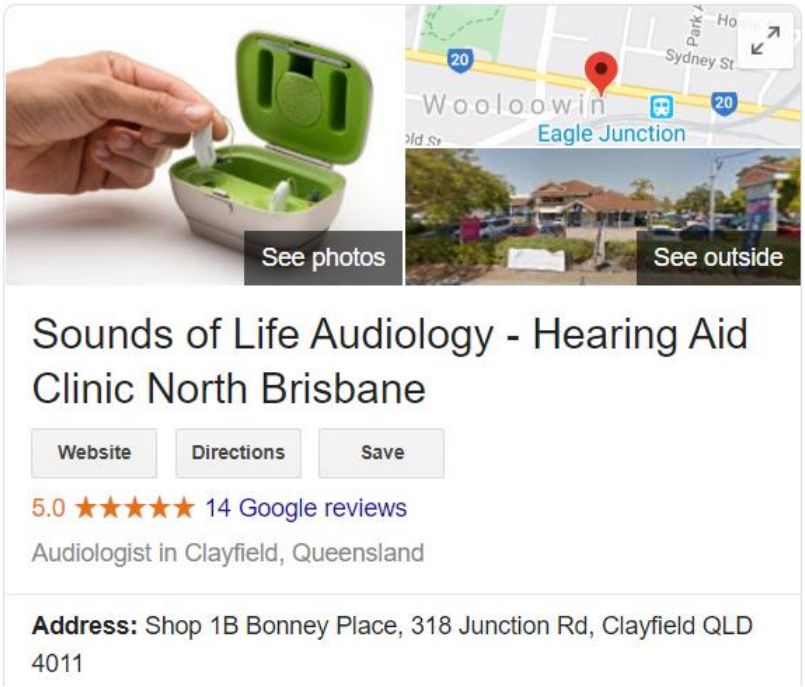
A good quality hearing services provider should be willing to be transparent with their pricing, either publishing pricing on the internet or able to provide quotes over the phone. More and more providers are now offering unbundled pricing so it's now easier to work out comparative costs. However, even if provider does still bundle products and/or services, they should be happy to discuss their pricing and service offering without pressure to purchase from them.

Unfortunately to counteract consumers "shopping around", some aggressive businesses provide quotes that do not specifically identify the hearing aid models, but rather use internal (proprietary) names (e.g. "Gold" or "Silver" technology) making comparisons difficult. When requesting quotes, ensure they include specific product information – brand, model and level (e.g. Signia Pure 7nx).

Third party references

Seeking advice from third parties can help in making better decisions about the choice of hearing services provider. Talk to local doctors, occupational therapists or other trusted care providers about who they would recommend. In addition, speak to family and friends who have hearing aids about their experiences.

Another useful source for third party references is online sources such as Google and Facebook. Most hearing clinics will have a Google myBusiness page. By simply searching for the hearing clinic in Google, their myBusiness page should appear and this will have links to genuine third-party reviews (see example below).



Alternatively, most clinics will have a Facebook business page. Search for the clinic in Facebook and the page will have genuine third-party reviews (see example below).

Key Point 3 – Choose an independent audiologist who is clinically certified under the Commonwealth Hearing Services Program. Have a chat to the provider on the phone about likely costs of hearing aids and try to get third party references if possible

2.2. The process of getting hearing aids

There are four important steps in getting hearing aids:

1

Hearing Test

The hearing test will take approximately 60 minutes and determines the type and severity of hearing loss.

2

Hearing aid selection

Hearing aids come in a range of styles and technology levels (from basic/entry level to advanced/premium).

3

Fitting & Verification

The hearing aid fitting appointment will take approximately 60 minutes. The hearing aids will be programmed for optimal clarity and physical and acoustic comfort.

4

Follow up

After an acclimatisation period there will be a follow-up appointment to optimise the hearing aids and improve their performance in more complex/challenging listening settings.

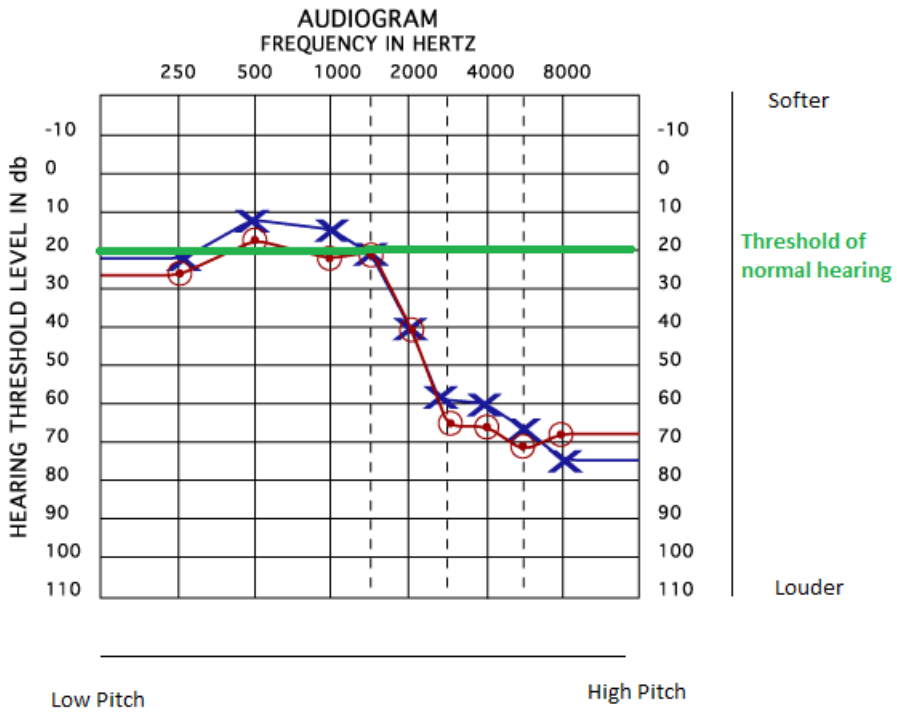
Step 1 – Hearing Test

The audiologist will do several tests to determine the degree of hearing loss. In addition, they will identify the location of the hearing loss. If required, they will refer on to a medical practitioner for further advice on whether the hearing loss can be managed medically or if there are other conditions that should be investigated.

The hearing test generally involves three types of evaluations:

1/ Pure-tone audiometry – measures hearing acuity at different frequencies and broadly localises the location and type of hearing loss; conductive, sensorineural or mixed. Pure-tone audiometry will produce an audiogram. An audiogram illustrates hearing ability by showing individual hearing at various frequencies (pitches).

During a hearing test, the results are recorded on the audiogram by means of red Os for the right ear and blue Xs for the left one. The resulting red and blue lines show the hearing threshold (the softest sounds heard) for each ear at different frequencies. A hearing threshold of between 0 and 20 dB is considered normal.



The vertical axis represents sound volume or intensity, which is measured in decibels (dB). The softest sounds are at the top of the chart and the loudest sounds at the bottom. The more one

moves down the axis, the higher the hearing threshold (worse the hearing). The horizontal axis represents sound frequency or pitch, measured in Hertz (Hz). Sound frequency increases gradually the further one moves to the right along the axis. The frequencies most often tested are 250, 500, 1000, 2000, 4000 and 8000 Hz.

Classification of Hearing Loss	Hearing Threshold
Normal hearing	0 to 20 dB
Mild	21 to 30 dB
Moderate	31 to 55 dB
Moderately-severe	56 to 70 dB
Severe	71 to 90 dB
Profound	91+ dB

2/ Tympanometry – identifies problems in the middle ear by measuring the sound movement and sound reflection through the eardrum (tympanic membrane) and middle ear system (for example identifies conditions such as middle ear effusion or eustachian tube dysfunction)

3/ Speech audiometry – measures the ability to hear familiar words at different volume levels to determine ability to understand speech and to assess the benefits of hearing aids. This is a very important test that complements the pure-tone audiometry as the brain plays a crucial role in hearing. Two people with identical hearing losses can have very different speech comprehension and have very different hearing aid requirements.

Other ancillary tests may be conducted depending on the above results.

Key Point 4 – Request copies of test results. This is useful for several reasons – maintaining personal records, monitoring hearing levels and to provide to other health professionals upon request.

Step 2- Hearing aid selection

Every person has unique hearing needs and there is no “one size fits all” solution to hearing loss. The audiologist will recommend appropriate hearing aids and accessories suitable for the specific hearing loss. However, it is also very important that the audiologist spends the time to discuss the wearer’s specific lifestyle needs and style preferences. For more information about appropriate hearing aids see **“Choosing the Right Hearing Aids” section.**

Step 3 – Fitting & Verification

Once the hearing aid has been selected with a style and performance level that meets the wearer’s individual anatomical requirements, cosmetic preferences and lifestyle needs, it’s now time for the audiologist to set up the hearing aids. The goal is to precisely compensate for the assessed hearing loss and to ensure the hearing aids fit in with the wearer’s lifestyle.

The first step will be to program the hearing aids for the individual hearing loss as indicated in the audiogram. In addition to using a computer to precisely program the amplification requirements at different frequencies, the audiologist should also do some measurements using a probe microphone in the ear-canal. These real ear measurements ensure there is precisely the correct amount of amplification at the ear drum.

Once the standard amplification settings have been set, the audiologist will make further fine-tuning to ensure the hearing aids do not feedback (whistle). Hearing aids are optimised for listening to speech. They will automatically adapt to different situations with the goal of optimising speech intelligibility. However, if in some selected situations, speech is not a priority (such as when listening to music), to manage this, different programs for specific situations can be set up by the audiologist. These programs can be accessed easily when required.

Key Point 5 – Ensure the audiologist does real ear measurements. Although not necessary for hearing aid trials, it's the only way to truly precisely program the hearing aid for a correct final fitting. Otherwise the setting will be based on an average ear and will give average results.

Step 4 - Follow-up

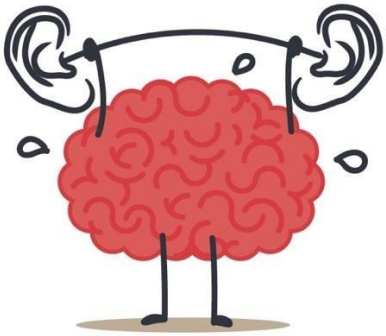
Like everything new, it may take a little while to become familiar with the new hearing aids and to adjust to their sound. After the acclimatisation period, there will be a follow-up appointment to fine-tune and optimise the hearing aids to improve their performance in everyday listening environments. This will also be an opportunity to ask any further questions and address any other issues e.g. management.

Key Point 6 – After the fitting try to take notes of the situations or sounds that could possibly be improved. This will assist the audiologist in fine-tune the hearing aids.

2.3. Sooner rather than later

For many people hearing loss often occurs gradually over many, many years. People may, sometimes even unconsciously, compensate for their declining hearing by avoiding noisy places and lip reading. However, there comes a point whereby such strategies are not enough and at this point people consider hearing aids.

Use it or lose it - this certainly applies to hearing.



Time to face the problem!

The earlier something is done about hearing loss the better. Even when hearing is just starting to deteriorate, a hearing aid helps maintain the neural pathways responsible for hearing and understanding surrounding sounds.

Key Point 7 – The longer the delay in getting hearing aids, the harder it can be to get used to them.

3. Choosing the Right Hearing Aids

Every person has unique hearing needs and there is no “one size fits all” solution to hearing loss. When deciding on a hearing aid it is important that the technology is matched to specific hearing levels, individual lifestyle needs and cosmetic preference.

The decision on what hearing aids are purchased is not only based on the degree and type of hearing loss or the individual ear anatomy, but is also impacted by personal preferences:

- Cosmetic preferences - this impacts the style of hearing aid e.g. A preference for more discreet styles like IICs (invisible-in-canal) that sit deep into the ear canals
- Lifestyle requirements – this impacts the technology level of the hearing aid e.g. Active and social individuals or those working in noisy environments.

Key Point 8 – make sure the audiologist has a thorough understanding of individual lifestyle needs and style preferences.

3.1. Hearing aid styles

There are many different styles of hearing aids. Each style has its advantages and disadvantages. Although there may be a cosmetic preference for a style of hearing aid it is important to understand the advantages and disadvantages of a style. For example, a very small IIC (invisible in the canal) device will be undetectable from the outside but may sacrifice some advanced technology such as directional microphones that may be very useful for hearing in challenging situations such as group conversations. Here are the general pros and cons of the different styles:

Invisible-in-the-Canal (IIC) & Completely-in-the-Canal (CIC):

Tailor-made for individual ear anatomy these styles are extremely small and discreet, sitting deeply in the ear canal. They are suitable for mild to moderate hearing loss.

Pros	Cons
Ultra-discreet and often virtually invisible when worn	May not be suitable for all ears due to their size
Takes advantage of the natural acoustics of the ear (pinna)	Can cause a blocked-up feeling in the ear
	Due to their size some technology is sacrificed
	Wax can block the speaker (receiver)

In-the-Canal (ITC) & In-the-Ear (ITE)

Custom-made to individual ear anatomy these styles are small and discreet, sitting just inside the ear. They are suitable for nearly all levels of hearing loss from mild to severe and they can accommodate sophisticated technology.

Pros	Cons
Small and discreet, but visible from the outside (larger than IICs/CICs)	Can cause a blocked up feeling in the ear
Can accommodate sophisticated technology	Wax can block the speaker (receiver)
Can be easier to manage for people with limited dexterity	

Standard Behind-the-Ear (BTE)

These styles are very popular and are available in a wide range of sizes, including micro-discreet styles. The unit sits behind the ear with a tube leading to a custom mould or tip within the ear canal. They are suitable for nearly all levels of hearing loss from mild to profound.

Pros	Cons
Wide variety of styles, including micro BTE styles	Visible from the outside
Can accommodate sophisticated technology	More powerful models can be quite large
Can be well vented to reduce any blocked-up feeling	

Receiver-in-Canal (RIC)

Receiver in canal styles are a discreet yet powerful solution. The unit sits behind the ear with a slim wire leading to the receiver which sits directly in the ear canal. The housing is tiny and when on the ear is virtually invisible. This style can provide high levels of amplification and is suitable for nearly all levels of hearing loss from mild to severe.

Pros	Cons
Discreet design without sacrificing performance	Wax can block the speaker (receiver)
Can accommodate sophisticated technology	
Can be well vented to reduce any blocked-up feeling	

Key Point 9 – if there is a strong preference for a style make sure to understand the pros and cons of the style. Smaller styles like IICs it may not have the technology to match every lifestyle need.

3.2. How do hearing aids work?

Modern hearing aids are tiny, high tech marvels providing a customised sound experience by precisely amplifying missing sounds enabling wearers to listen, communicate, and participate more fully in daily activities.

All digital hearing aids consist of five basic parts:

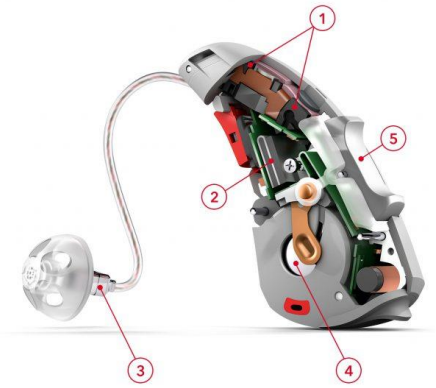
(1) Microphone(s)

(2) Digital processing chip and amplifier

(3) Receiver (essentially a speaker)

(4) Battery

(5) Volume control / Program control



All digital hearing aids work in the same basic manner. They receive sound through their microphone(s) and convert this sound to electrical signals. These electrical signals are then sent to the digital processing chip and amplifier. The digital processing chip and amplifier precisely analyses these signals and then amplifies them (increase their power) to meet the needs of the wearer. The signals are then sent to the hearing aid's speaker for conversion back into sound to be delivered into the hearing aid wearer's ear.

In amplifying sound, hearing aids provide gain which is defined as the amount of extra volume (decibels) added to the sound (the difference between the input level and the output level). It is important that hearing aids are set to provide the correct amount of gain at each frequency based on an individual's assessed hearing loss.

3.3.Hearing aid technology

Modern hearing aids have a computer chip, which is programmed by the hearing care professional to precisely meet the needs of the wearer. They offer many advanced features that enable improved hearing even in the most challenging situations and can connect to a range of electronic devices such as mobile phones, televisions or digital music players.

There is a wide range of hearing aid technology on the market. Most manufactures offer four to five performance levels from basic to premium. Higher performance levels provide enhanced technology to improve speech clarity and sound quality in more challenging situations and offer more personalisation options.

Depending on the level of technology selected, it's important that it meets individual needs appropriately – not only assessed audiological needs, but also specific lifestyle needs.

Key Point 10 – It's important to understand the benefits of hearing aid features to determine whether they meet your needs. For example, there is no point paying a fortune for the latest technology to reduce background noise in challenging situations if you only want to use your hearing aid for watching TV!

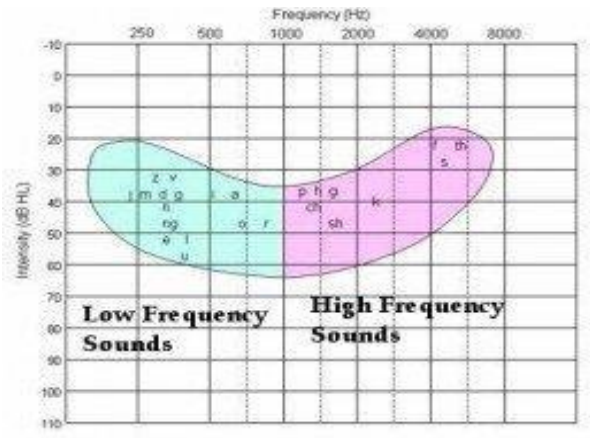
To assist in determining what technology is most appropriate the next section will discuss features that are current in hearing aids. Features will be broken up into two sections:

Fundamental features – these are features fundamental for any hearing aid to effectively compensate for hearing loss. At a minimum, all hearing aids should have these features.

Advanced features – these are features that for some people are required as they need to hear either in more complex listening situations (e.g. in background noise) or in special situations (e.g. listening to music). Whether these features are appropriate depends on individual lifestyle.

Fundamental Features

Broad Frequency Range Humans with normal hearing can detect a wide range of sound frequencies (or pitches) from 20 Hz to 20,000 Hz. Speech is predominantly in the 250 to 6,000 Hz range with vowel sounds such as “u” being low frequency (250 to 1,000 Hz) and consonants like “s,” “h” and “f” being high frequency (1,500 to 6,000 Hz). As most hearing loss starts in the higher frequencies, people tend to notice as their hearing loss progresses that speech starts to become unclear – they start to miss the beginning and ends of words.



Fundamental Feature – To be able to amplify the major components of speech, a hearing aid needs to be able to amplify frequencies up to or exceeding 6000 Hz.

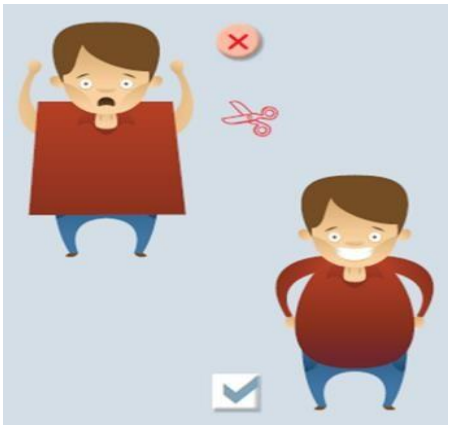
Bands and Channels

Two of the most important features of hearing aids are “Bands” and Channels”. These terms are often used interchangeably, but they do refer to different characteristics in the hearing aid.

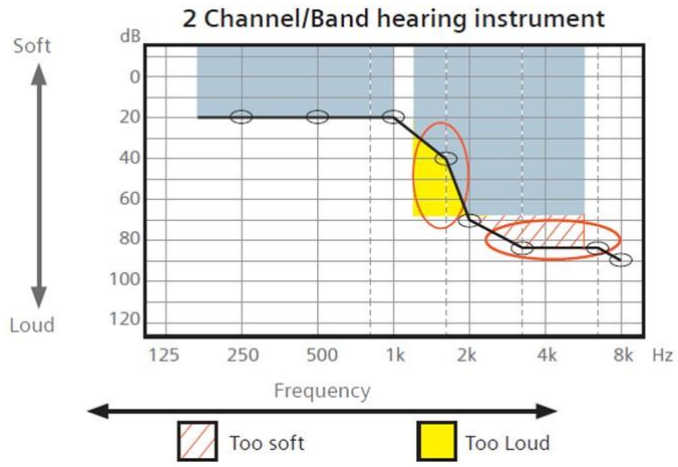
Bands

The goal of a hearing aid is to amplify sounds to precisely compensate for an individual’s hearing loss. Hearing loss may vary across the frequency spectrum. A hearing aid therefore must be able to programmed to provide the correct amount of volume at each frequency so it matches a specific audiogram accurately. To do this, it must be possible to independently adjust the volume of different frequency areas (called bands). The number of bands a hearing aid refers to the number of adjustment “areas” or "handles" provided in the programming software for volume manipulation. The more areas or frequency bands that volume can be adjusted, the more flexible the frequency shaping to match individual hearing loss.

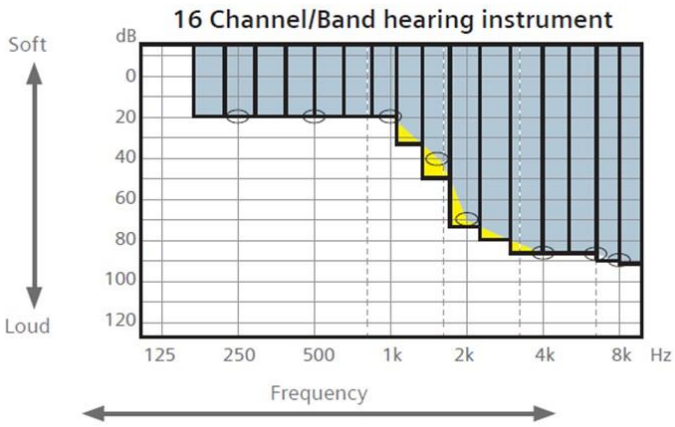
“Matching your hearing loss is just like tailoring a shirt to your body. The more areas that the tailor is able to adjust, the better fit the shirt will be”



Examples – the below a hearing aid with only two bands cannot precisely match the hearing loss - at some frequencies it will be over-amplifying, while under amplifying others.



In contrast, a 16-band hearing aid does a must better job compensating for the hearing loss by providing the correct amount of amplification at each frequency.



So, what should be the minimum number of bands in a hearing aid?

This depends somewhat on individual hearing loss. If the hearing loss is unusual in that it steeply slopes or has narrow notches, then a higher number of bands would probably provide the most benefit. However, in general, a hearing aid with eight or more bands will provide adequate frequency shaping flexibility for most hearing losses.

Fundamental Feature – As hearing loss varies across frequencies, it is important that the gain (or volume) of the hearing aid can be adjusted at different frequencies to match individual hearing loss.

Channels

While bands allow differential volume adjustment across different areas of the frequency spectrum, channels go further to allow differential sound processing.

This differential sound processing is used to improve hearing aid sound clarity, sound quality and sound comfort. In addition, it is used to extract speech from noise in challenging listening situations. There are several features that operate independently in channels, including fundamental features like compression to more advanced features such as digital noise reduction and directionality.

So, what should be the minimum number of channels in a hearing aid?

This depends somewhat on lifestyle. An individual with a quiet home life and little background noise would find that a four-channel hearing aid would be adequate. For an active individual who is exposed to a lot of background noise, eight or more bands will provide significantly better performance.

Fundamental Feature – A hearing aid needs to have multiple channels to provide clear and comfortable sound for the wearer, no matter the sound input level and frequency.

Compression

With sensorineural hearing loss, it is likely that at some frequencies, soft sounds cannot be heard, while medium level sounds can be heard but with difficulty. However, for the same frequencies, loud sounds can be heard easily. This phenomenon is called recruitment. If a hearing aid was set to linearly amplify all inputs (with the same gain/volume) so that soft sounds were clearly audible, it is likely that medium and loud sounds would be uncomfortable. For soft sounds to be audible, with loud sounds comfortable, hearing aids use compression. Compression automatically adjusts the gain (volume) of the hearing aid depending on the input signal level. Soft sounds are given more volume than loud sounds. Hearing aids with multi-channel compression have compression working independently in each channel.

Fundamental Feature – Compression is necessary to address recruitment and provide both audibility and listening comfort, regardless of the sound input level and frequency.

Feedback Management

Due to the small size of hearing aids, their microphones sit very close to the receiver (speaker). One of the negative consequences of this is that when sounds are amplified this causes feedback. Feedback is often heard as an uncomfortable whistling. Feedback is very common in hearing aids fitted as an "open" fitting where the ear canal is not sealed - amplified sound is more likely to escape from the ear canal and get picked up by hearing aid microphone.

Fortunately, there has been significant advances in feedback management technology. Almost all modern hearing aids feature adaptive feedback cancellation technology. This technology effectively cancels feedback by continuously estimating the feedback path and generating a corresponding out-of-phase signal. Thus, feedback is suppressed without reducing the volume of external signals like speech, music and environmental sounds.

Fundamental Feature – For a hearing aid to be worn comfortably without feedback, a good feedback cancellation system is required.

Multiple Programs

Most hearing aids have multiple programs to cater to different listening situations. Each listening program can be set differently to provide an optimal hearing experience. For example, a noise program may provide a directional microphone, more aggressive noise reduction and a softer volume level to provide for listening comfort. Many digital hearing aids can automatically switch between hearing programs depending on the users' acoustic situation.

Water and Dust Resistance

To meet the demands of wearers, hearing aids are designed with reliability and durability in mind. One area that hearing aid manufacturers are increasingly focusing on to improve hearing aid robustness is water and dust resistance (hindrance against penetration by water and dust). Most hearing aid manufacturers now publish ingress protection (IP) ratings.

The IP rating consists of two digits. The first digit indicates the level of protection of the hearing aid from solid foreign objects (e.g. dust). The second digit indicates the level of protection of the hearing aid from harmful ingress of water. In selecting a hearing aid, wearers should look for ratings for at least IP57 or higher:

- IP5x: Dust Protected – Ingress of dust does not enter in enough quantity to interfere with the satisfactory operation of the hearing aid
- IPx7: Water-resistant – Ingress of water in harmful quantities prevented when hearing aids are immersed in 1 m of water for 30 min

Fundamental Feature – IP ratings provide information regarding hearing aid reliability through varying levels of water and dust resistance. High IP ratings are recommended for people who are active and are unable to take their hearing aids out in demanding situations.

Key Point 11 – Only consider hearing aids that have fundamental features such as: a minimum of eight bands and channels, feedback cancellation, multiple programs, ip57 rated or higher and at least a 6 kHz bandwidth. If they do not, it may be best to explore alternative hearing aid options.

Advanced Features

Directional Microphones

Directional microphone technology is presently the most effective method for improving speech understanding in noisy environments. With two or more microphones, a directional microphone focuses on sounds coming from the front while reducing noise from the sides and the back.

In most situations with background noise, conversations tend to occur between individuals facing each other directly. In such situations, directional microphones will effectively focus on and amplify the speaker while reducing background noise.

Automatic directional microphones

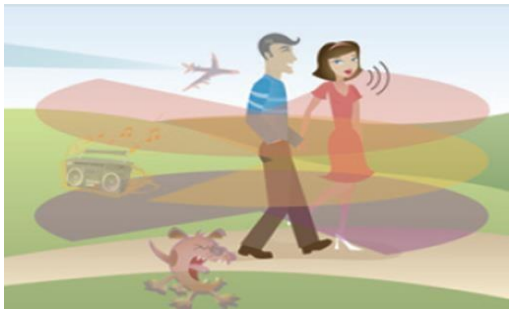
Most hearing aids automatically change between omni-directional and directional when necessary so there is no need to turn the directional microphone on and off manually.

More advanced hearing aids will go further to set the degree of directivity depending on the amount of environmental noise. At low noise levels the directional microphone will be less directional and at high noise levels the directional microphone will be more directional. Some versions of this directional technology are so effective that the speech understanding of wearers with moderate degrees of hearing loss outperform people with normal hearing in challenging noisy situations*.

Adaptive directional microphones

Adaptive directional microphone technology adaptively reduces moving noise sources while focusing on the target sound source at the front.

A Broadband Adaptive Directional Microphone adaptively tracks and attenuates one single dominant noise source. A Multi-Channel Adaptive Directional Microphone tracks and attenuates multiple noise sources.



Advanced Feature – Adaptive directional microphones are the most effective method for improving speech understanding in noisy environments. It is recommended for socially active people who are regularly in challenging noisy situations like restaurants, business meetings or social groups.

*Two clinical studies have shown that Siemens binax provides better than normal hearing in certain demanding environments (University of Northern Colorado, 2014; Oldenburg Hörzentrum, 2013): Speech Reception Thresholds (SRT) in cocktail-party situations improved up to 2.9 dB for wearers with mild to moderate hearing loss using Carat binax or Pure binax hearing aids with narrow directionality, compared to people with normal hearing.

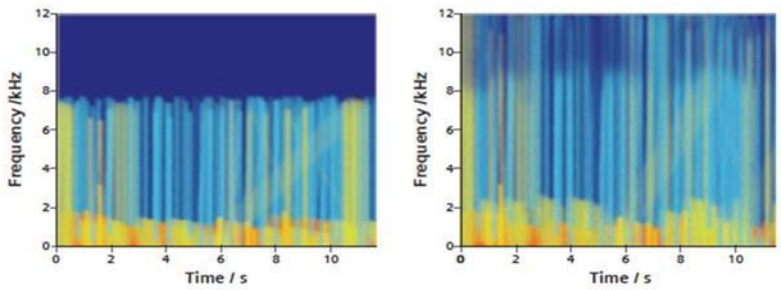
Speech and Noise Management

Noise Reduction technology reduces background noise. By analysing the input in each channel, the hearing aid can differentiate between speech and noise, aiming to enhance speech and reduce noise. As a large percentage of background noise is transient in nature (such as a glass dropping or door slamming) more advanced systems can manage impulsive noise signals without affecting the spectrum of speech signals.

Advanced Feature – Noise reduction technology is very effective in improving wearing comfort in noisy environments. It is recommended for socially active people who are regularly in challenging noisy situations like restaurants, business meetings or social groups.

Extended Bandwidth and Input

Most standard hearing aids amplify sound to a bandwidth of between 6000 – 8000 Hz which is satisfactory for listening to speech, but not optimal for listening to music. Even with specific programs dedicated to music the hearing aids generally deliver only average sound quality. More advanced hearing aids now offer extended bandwidths with some manufacturers now offering bandwidth up to 12 kHz.



Some hearing aids also feature a higher input level. If listening to loud music, regular hearing aids tend to cut off the upper level inputs. Advanced hearing aids can accommodate inputs up to 115 dB SPL providing a fuller picture of the music.

Advanced Feature – Extended bandwidth improves sound quality, especially when listening to music. It is recommended for people who like listening to recorded/live music or who play music.

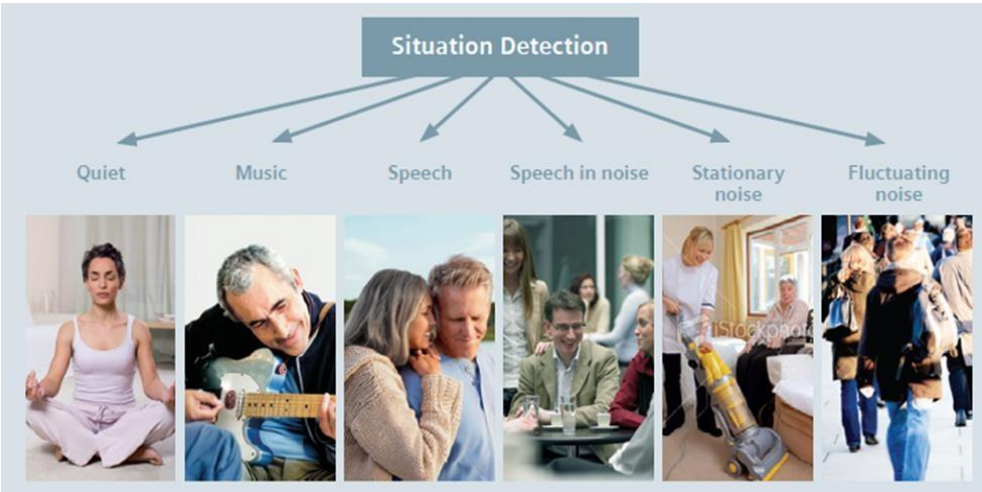
Wind Noise Management

Microphones are designed to pick up sound and are therefore a key component for every hearing aid. However, a hearing aid in windy conditions is susceptible to mistaking air passing over its microphone diaphragm for real sound and results in the wind interference being amplified. Advanced hearing aids feature wind reduction technology that reduces the impact of the wind noise.

Advanced Feature – Wind noise reduction improves negative impact of inappropriately amplified wind noise. It is recommended for people who wear their hearing aids outdoors e.g. playing golf.

Environmental Adaption

Hearing aids with environmental adaption automatically adapt to different environments or situations the wearer experiences. The hearing aids classify the environmental situation (e.g. speech in noise) then automatically activate features that will improve speech intelligibility, sound quality and listening comfort. Rather than wearers having to manually activate/deactivate specific features (e.g. directional microphone technology), the hearing aid will automatically adapt in a seamless manner.



Advanced Feature – Environmental adaptation reduces/eliminates the need to manually adjust the hearing aids in different situations. The aid automatically adapts to different situations to improve speech intelligibility, sound quality and listening comfort.

Learning

Imagine having an audiologist constantly adjusting the hearing aid settings to best match changing hearing needs in different situations. Hearing aid learning technology does exactly this, except the audiologist is left back in the clinic. Hearing aid learning is a relatively new technology available in some hearing aids. This technology allows hearing aid wearers to "teach" the hearing aids their volume preferences for sounds in their everyday environment.

Advanced Feature – Over time the hearing aids learn their wearer's sound preferences in different situations. It is recommended for people who want their hearing aids 100% personalised or have specific requirements.

Connectivity & Apps

To enhance sound quality and listening enjoyment, many hearing aid models now feature the ability to wirelessly connect to different audio devices including mobile phones and TVs. Using this connection wearers can wirelessly stream high quality stereo sound from these devices into their hearing aids. For example, when using the phone wearers can converse in a hands-free manner (without even removing the phone from their bag or pocket) with the hearing aids becoming a virtual phone headset. This technology is not only convenient, but improves sound quality when using the mobile phones, watching TV or listening to music.

Wireless audio-streaming can be achieved either directly or indirectly (via a secondary streaming device usually worn around the neck or in a pocket).

Direct Wireless Audio Streaming (without an additional body-worn device) from Apple devices is supported by many hearing aids on the market. If the Apple devices support the "Made for iPhone™" standard, wearers can directly stream audio wirelessly (using low energy 2.4 gigahertz wireless technology) from their Apple device to their hearing aids without an intermediary or secondary device. Although not widely available with Android phones, this direct streaming technology has recently become available with the release of the Android 10 operating system and is supported by a couple of hearing aids.

For non-phone use, for specific applications (e.g. watching television) many hearing aids offer additional accessories (e.g. television transmitters). These accessories use similar wireless technology as the iPhone and enable direct wireless audio streaming to the wearers hearing aids without any intermediary body worn accessories.

The main disadvantage of direct wireless audio streaming is that it requires high battery consumption and for most hearing aids is only available on Apple devices.

Indirect Wireless Audio Streaming (with an intermediary device) is supported by most hearing aids on the market. This involves the purchase of an additional Bluetooth accessory which is body worn. This Bluetooth accessory receives streamed audio (via Classic Bluetooth) from most Bluetooth enabled devices (e.g. phones, televisions) then streams this audio wirelessly to the hearing aids

using magnetic near-field induction. The disadvantage of this type of audio-streaming is that wearers must wear an extra device on their body.

Smartphone Apps for both Android and iOS (Apple) devices are available free-of-charge for most hearing aids. Most of these apps allow the user to remotely control their hearing aids via their smartphone. Wearers can discreetly control their hearing aid's volume, programs, as well as manage audio streaming.

Advanced Feature – Improved connectivity and apps increase usability and sound quality of mobile phones and other audio devices. It is recommended for regular mobile phones users or those who require wireless connection to their audio devices.

Rechargeability

Most hearing aid manufacturers now offer a range of rechargeable hearing aid options. The main benefits of rechargeable technology relate to convenience and ease of use. Battery changes can be very fiddly due to the small size of hearing aid batteries. For a typical hearing aid user, disposable non-rechargeable zinc-air batteries also need to be replaced at least fortnightly.

Lithium-ion rechargeable technology is commonly used in consumer electronics due to its high capacity (relative to size), minimal memory effect and low self-discharge. Only recently has this technology been utilised in hearing aids. As hearing aids improve in performance and utilise Bluetooth more and more, the requirement for a high capacity battery is critical.

Due to the significant advantages of Lithium-ion technology over the other rechargeable battery technologies, more manufacturers will be releasing models using lithium-ion over the coming years and it will be the dominant rechargeable technology in this industry.

Advanced Feature – Rechargeable hearing aids make management must easier and more convenient. At night, wearers simply need to place their hearing aids in the charger and overnight the hearing aids are recharged and ready in the morning for the busy day ahead

Key Point 12 - Manufactures will use a lot of marketing terms to describe their technology. When making hearing aid purchase decisions, consider carefully what each feature does and its appropriateness.

3.4. Major hearing aid brands

The hearing aid industry is dominated by five major manufacturers.

Sonova – markets Phonak and Unitron brands

Headquartered near Zurich, Switzerland, Phonak has developed, produced and globally distributed state-of-the-art hearing systems and wireless devices for more than 60 years.

Headquartered in Canada's Waterloo region and founded in 1964, Unitron is a global innovator of technologically advanced hearing aids. Unitron is currently one of the fastest growing, most successful hearing aid manufacturers in the world.

WS Audiology – markets Siemens, Signia and Widex brands

The Siemens and Signia hearing aid brands are part of the Sivantos group. In 2015, Siemens divested its hearing aid division and a new company was formed: Sivantos. In 2016, Sivantos released a new hearing aid brand; Signia, which has now replaced the Siemens brand in the marketplace. The combined history of the Siemens and Signia brands date back to 1878 and represent a long history of German engineering, premium quality and cuttingedge technology and innovation.

Widex is one of the world's largest hearing aid manufacturers. Based in Denmark, it was founded in 1956 and is a family-owned company. Over its history Widex has produced several world firsts, including the world's first fully digital in-the-ear hearing aid.

Widex merged with Sivantos (Siemens / Signia) in 2019 to create a new company called WS Audiology.

Resound – markets the Resound brand

Headquartered in Ballerup, Denmark, ReSound is one of the world's largest provider of hearing aids. Since the company's inception in 1943, ReSound has been responsible for several hearing industry firsts, including Wide Dynamic Range Compression (WDRC), Digital Feedback Suppression (DFS) and the first open-standard digital chip.

William Demant – markets Oticon and Bernafon brands

Oticon is a global company that has helped pioneer the hearing industry more than a hundred years ago. Founded in 1904 by Hans Demant, Oticon is situated in Denmark outside the capital Copenhagen. The company is a subsidiary of the William Demant Holding Group.

Based in Bern, Switzerland, Bernafon has developed and engineered quality hearing aids for over 70 years. Included in a range of world firsts, in 1988, Bernafon introduced the world's first digitally programmable hearing instrument.

Starkey – markets the Starkey brand

Founded in 1967, Starkey is a world leader in manufacturing advanced hearing solutions. Starkey is renowned for its custom hearing aids in particular its invisible-in-the canal (IIC) models. Starkey was founded and is still headquartered in Eden Prairie, Minnesota, USA.

Key Point 13 - Be wary of smaller unknown brands, especially those not being sold via an audiologist (e.g. online or in chemists) as they will often market themselves as premium technology but are far from it. It is wise to stick with the major brands as they offer quality products with the very latest clinically proven hearing aid technology.

4. Ensuring Good Value for Money

Price is what you pay, value is what you get. There has been a lot of recent negative publicity about the hearing aid industry. A lot of the publicity has been around some large commercially aggressive chains over-charging customers - relying on clients limited hearing aid knowledge and their reluctance to shop around. Unfortunately, this practice is quite common.

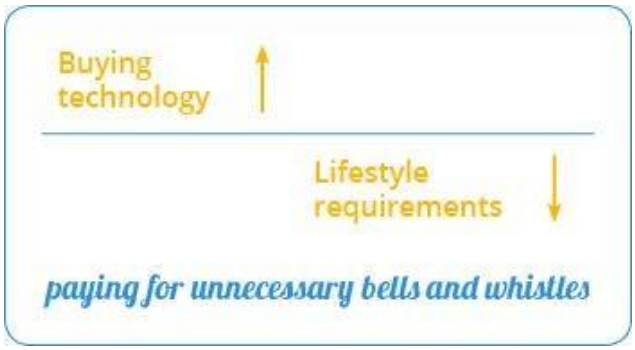
4.1. Four tips to avoid paying too much for hearing aids

1/ Understand the benefits of the different levels of hearing aid technology

Understand what is included in the purchase price. It's important that the hearing aid meets individual needs appropriately – not only audiological needs, but also lifestyle needs. Talk to an independent provider about what a higher level of technology can provide and what may be missed in going to a lower level of technology.

Buying technology **below** lifestyle requirements means **not maximising hearing potential.**

Buying technology **exceeding** lifestyle requirements means probably **paying for unnecessary bells and whistles.**



2/ Understand the service and support provided

Be aware of exactly what the service package entails and understand the warranty associated with the hearing aids purchased. There is more to getting hearing aids than a simple one-off fitting. When making a purchase decision, it is important to understand the extent and cost of ongoing support. For example, regular hearing tests should be carried out to monitor hearing levels and to adjust the hearing aids when required. The hearing aid itself should have at least a three years' manufacturer warranty.

3/ Ask for a free trial

Always try the hearing aid before purchase by requesting a one to two-week free trial. No matter how well the hearing provider tries to match the technology to individual needs, the only way to be sure the device is the right fit is to conduct a trial in the environment where it will be used the most.

4/ Shop around

After receiving a quote for a hearing aid model, check online or phone around to see what other providers are selling those models for. It is not uncommon to save many thousands of dollars simply by shopping around. Fortunately, more and more customers are requesting quotes and shopping around. Unfortunately, some aggressive businesses have responded by providing quotes that do not specifically identify the hearing aid quoted, but rather use internal (proprietary) names such "Gold" or "Silver" level hearing aids, making comparisons difficult. Make sure to ask for the manufacturer name and the exact hearing aid model name as well as understanding what services are included.

Key Point 14 – To avoid overpaying for hearing aids be sure to understand the benefits of the different levels of hearing aid technology and what service and support is provided. After deciding on a model, shop around to compare quotes and ask for a free trial to check suitability in a real-world environment.

4.2. Why hearing aids should not be purchased overseas via the internet

Hearing aids are medical devices – they are designed to have amplification that is precisely customised to the wearer's individual hearing loss. In Australia, hearing aids are classified as Class II medical devices by the therapeutic goods administration (TGA). All hearing aid manufacturers are required to be registered with the TGA.

Hearing aids that are not precisely programmed can have one of two results – they may be ineffective, such as when they are set too soft, but also have the potential to cause damage, such as being set too loud and cause hearing loss. Thus, in Australia, hearing aid manufacturers will only supply to hearing clinics that support face-to-face fitting.

While purchasing hearing aids online from overseas may seem like savvy shopping, be aware that these fall outside the scope of TGA and some protections may be lost. In addition, it is unlikely the same warranty conditions will apply, including a lack of local service so hearing aids need to be sent back overseas for warranty claims. The cost of hearing aids generally includes both the devices and the service costs (hearing test, fitting and follow-up). Obviously, overseas purchases include only the devices and all services will need to be provided by a local hearing provider – not all providers are willing to work with unknown devices purchased overseas.

Key Point 15 – There are a lot of potential problems that may be encountered if hearing aids are purchased online from overseas. Try to source hearing aids locally in Australia as they will be backed by local warranties and support.

4.3. Funding options

There are no arguments about it, good hearing aids are not cheap. Hearing aids are a significant investment. However, this investment can be life-changing!

Private Health Insurance

Private health insurers may provide a rebate for the fitting of hearing aids. Availability will depend on individual health insurance companies and specific level of cover. It is a good idea to contact health insurers prior to committing to purchasing hearing aids to determine what rebates may be applicable.

Australian Government Hearing Services Program

If you are a pensioner or veteran you may be eligible for either fully-subsidised hearing aids or partially subsidised hearing aids through the Commonwealth Hearing Services Program. For more information, see: www.hearingservices.gov.au

Medical Expenses Tax Offset

Hearing aids are considered an eligible medical expense by the Australian Tax Office (ATO). Net medical expenses are the medical expenses paid less any refunds received, or could be received, from Medicare or a private health insurer.

5. Summary of Important Tips

The impact of Hearing Loss

Key Point 1 - Hearing loss should not be considered a minor ailment. It can have significantly impact well-being - symptoms of hearing loss should be checked as soon as possible.

Getting Hearing aids

Key Point 2 - Modern hearing aids that are properly fitted have been shown to not only improve the hearing of wearers, but to also improve their psycho-social wellbeing.

Key Point 3 - Choose an independent audiologist who is clinically certified under the Commonwealth Hearing Services Program. Have a chat to the audiologist on the phone about likely costs of hearing aids and try to get third party references if possible.

Key Point 4 - Request copies of test results. This is useful for maintaining personal records, monitoring hearing levels and to provide to other health professionals upon request.

Key Point 5 - Ensure the audiologist does real ear measurements. Although not necessary for hearing aid trials, it's the only way to truly precisely program the hearing aid for a correct final fitting. Otherwise the setting will be based on an average ear and will give average results.

Key Point 6 - After the fitting try to take notes of the situations or sounds that could possibly be improved. This will assist the audiologist in fine-tune the hearing aids.

Key Point 7 – The longer the delay in getting hearing aids, the harder it can be getting use to them.

Choosing the right hearing aids

Key Point 8 - make sure the audiologist has a thorough understanding of individual lifestyle needs and style preferences.

Key Point 9 - if there is a strong preference for a style make sure to understand its pros and cons. Smaller styles like IICs it may not have the technology to match every lifestyle need.

Key Point 10 - It's important to understand the benefits of hearing aid features to determine whether they are appropriate and useful. For example, there is no point paying a fortune for the latest technology to reduce background noise in complex listening situations if the aid is intended only for watching television!

Key Point 11 - Only consider hearing aids that have fundamental features such as: a minimum of eight bands and channels, feedback cancellation, multiple programs and at least a 6kHz bandwidth. If they do not, it may be best to explore alternative hearing aid options.

Key Point 12 - Manufacturers use a lot of marketing terms to describe their technology. When deciding to purchase hearing aids, consider carefully what each feature does and its benefits.

Key Point 13 - Be wary of smaller unknown brands, especially those not being sold via an audiologist (e.g. online or in chemists) as they will often market themselves as premium technology but are far from it. It is wise to stick with the major brands as they offer quality products with the very latest clinically proven hearing aid technology.

Ensuring good value for money

Key Point 14 - To avoid overpaying for hearing aids be sure to understand the benefits of the different levels of hearing aid technology and what service and support is provided. After deciding on a model, shop around to compare quotes and ask for a free trial to check suitability in a real-world environment.

Key Point 15 - There are a lot of potential problems that may be encountered if hearing aids are purchased online from overseas. Try to source hearing aids locally in Australia as they will be backed by local warranties and support.

6. About Sounds of Life

Sounds of Life Audiology is a Brisbane family-owned business – owned and operated by audiologists. We are committed to offering our clients value for money: high quality hearing care/hearing aids at affordable prices.

In addition to offering affordable and transparent hearing aid pricing, we offer industry-leading after-care with our Platinum Aftercare Package, available free-of-charge with all hearing aid purchases.

Our audiologists are accredited by Audiology Australia and see both self-funded and eligible government clients (Sounds of Life is a contracted service provider of hearing services to eligible clients under the Australian Government Hearing Services Program).

At Sounds of Life we believe in providing all the necessary information and support, so our clients can make informed decisions about their hearing health. We pride ourselves on:

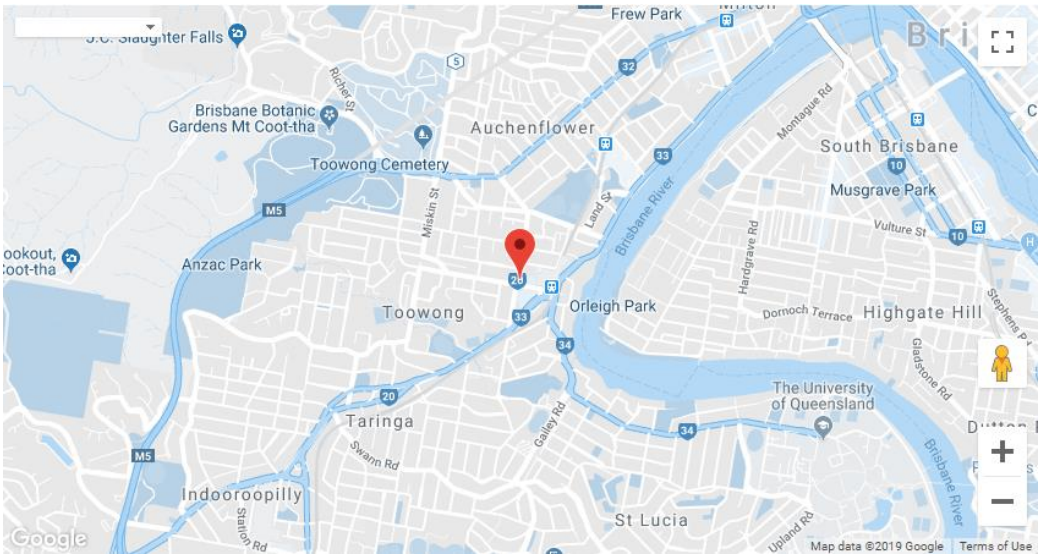
Being fully independent – Sounds of Life is not owned or operated by a hearing aid manufacturer or a large multinational. We have access to all leading hearing aid brands including Siemens, Signia, Phonak, Starkey, Unitron, Resound, Bernafon, Oticon and Sonic Innovations. This means we can pick the "best of the best" technology to meet your individual needs.

Ethical Business Practices – When you see one of our Masters-qualified audiologists you can be confident you will receive the highest levels of hearing care. Sounds of Life is not contracted to a single hearing aid manufacturer and our clinicians do not work for commission. We strongly believe in case continuity to ensure you can develop a strong and productive relationship with your audiologist.

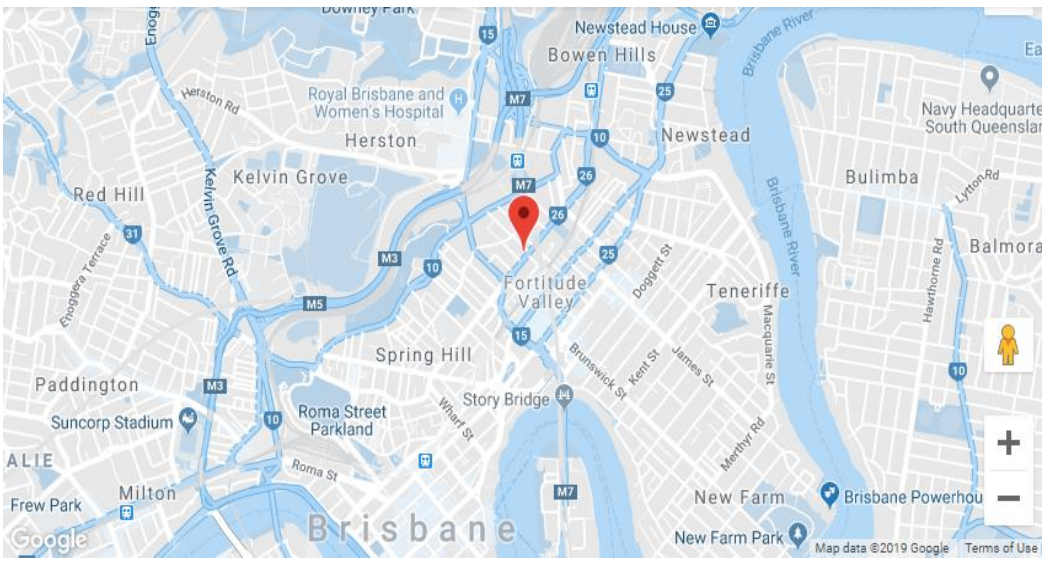
If you would like more information, please call 1300 744 432

6.1. Our locations

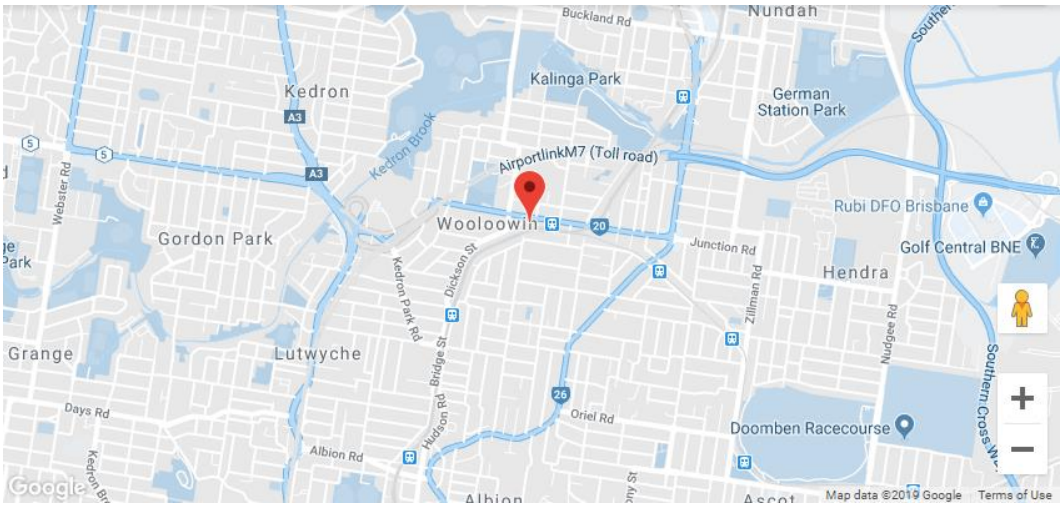
55 Sherwood Road (corner of Sherwood Rd and Jephson St), Toowong, QLD 4066



TUH Building, 438 St Pauls Terrace, Fortitude Valley, QLD 4006



Shop 1B, Bonney Place, 318 Junction Road, Clayfield, QLD 4011



Caboolture Super Clinic, 23-27 George St, Caboolture QLD 4510