



1096 East 50 South • American Fork, UT 84003 • (801)-763-2444

## Which hearing aid is right for me?

*As you are considering being fitted with hearing aids, it is important that you understand as much as you can about the choices available.*

*We will guide you in making an informed choice to support your communication needs – but, ultimately, it is your decision and what you choose will directly affect how satisfied you are with your hearing aids.*

*This booklet gives details about contemporary hearing aid technology; the size and shape of hearing aids; and the advantages/disadvantages of each of these alternatives.*

At Wasatch Hearing and Balance, we offer you free of charge as many appointments as needed after a hearing aid purchase. This allows us to provide support while you adapt to your hearing aids, as well as to carry out any fine tuning required.

While we encourage you to choose your hearing aids carefully, there is a 1 month return (10% restocking fee) or exchange option provided on all hearing aids purchased. Please check your quote letter for full details.

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### Hearing Aid Styles

Hearing aids are available in either a behind-the-ear (BTE) style or are fully contained in the ear (CIC, ITC, ITE). Your choice of hearing aid style will be determined by the technology required for your hearing needs and level of hearing loss; by the appearance and relative visibility of the hearing aids; by your manual dexterity ability; and by the size and shape of your ears.

We will encourage you to wear your hearing aids most of the time so that you fully adapt to them. For this reason it is important that you are comfortable with the appearance of your



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hearing aids. Ease of handling/dexterity and degree of hearing loss will also influence the choice of size and appearance of the hearing aids. Inappropriate hearing aid choice can increase the level of hearing disability if you cannot manage the complexity or size of your hearing aids.

### *Behind-the-ear (BTE) hearing aids*

This style of hearing aid consists of a plastic or silicon ear mould, customized to fit your ear, joined with plastic tubing to the hearing aid, which hangs behind the ear.

BTE hearing aids are more robust (and therefore more reliable) than smaller in-the-ear hearing aids. They use a larger battery, are easy to manipulate and incorporate multi-microphone technology allowing for directional and zoom amplification to assist hearing speech in a noisy environment.

If a BTE hearing aid breaks down, it can be easily replaced by a loan aid using your customized ear mould.

These hearing aids are available in a range of colors to match your hair color, and are available in a range of sizes:

### ***Slim tube, micro BTE***

Slim tube, micro BTE hearing aids have been designed for people with a mild, ranging to severe, mid and high frequency hearing loss. They are the most commonly used hearing aid style nowadays, because of their many advantages and because this is the most common pattern of hearing loss.

The ear mould is joined with narrow plastic tubing to the miniature hearing aid, which hangs behind the ear.

*Advantages:* the mould used with this style of hearing aid is hollow and does not occlude or block the ear canal. As a result, it is comfortable, your ear canal resonance is maintained so the amplification obtained is more natural, and your own voice distortion is minimal.

These aids have been designed to be cosmetically appealing: the mould is customized to fit into your ear canal so it is not readily visible, the hearing aid is miniaturized and the narrow tubing is discreet.

They can be fitted to people with a hearing loss in the early stages, where hearing aid use may not previously have been recommended as necessary. These aids are well accepted by people who have rejected occluding hearing aids in the past.

*Disadvantage:* The only (minor) disadvantage of this style of hearing aid is when using a telephone. The telephone receiver has to be positioned over the microphones, which are situated at the top of the hearing aid just behind the ear. Most hearing aids of this style allow for a specialized telephone program to be added if needed.

### ***Micro BTE with canal receiver (CRT)***

*Advantages:* The popularity of the slim tube, micro BTE hearing aid has resulted in the hearing aid manufacturers competing to produce the smallest possible BTE size hearing aid. A greater degree of miniaturization has been made possible by placing part of the hearing aid circuitry inside the ear canal. Apart from this cosmetic advantage, this style of hearing aid allows low frequency or bass amplification if this is required to suit your hearing loss.



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*Disadvantages:* the circuitry component partially blocks the ear canal creating a greater degree of occlusion or blockage, and is more vulnerable to moisture, wax and debris from the ear canal. This aid is too small for any switches to be incorporated, requiring the use of a remote control if adjustments are required. Another disadvantage is the smaller battery size, which needs to be replaced more often.

### ***Behind-the-ear (BTE) with conventional mould***

Those with a severe to profound hearing loss will not obtain sufficient amplification with micro BTE hearing aids and slim tube, and will require a larger hearing aid, wider tubing and a mould that fills more of the ear.

Apart from the advantages listed above common to all BTE hearing aids, its *advantage* is that it can contain an extremely powerful circuit. Its *disadvantage* is its visibility.

### ***In-the-ear hearing aids***

In-the-ear hearing aids are fully contained in the ear, customized to fit the shape of your ear, and block or occlude the ear canal. They use the natural direction-finding features of the external ear to locate sounds, and can provide sufficient power for most mild to moderately-severe hearing losses, but are not powerful enough for a more severe/profound hearing loss.

These aids need to be actively maintained, as they are vulnerable to damage from moisture, wax and debris from the ear canal. They are available in a range of sizes:

### ***Completely-in-the-canal (CIC)***

A CIC hearing aid is inserted deeply into the ear canal.

*Advantages:* This is the smallest hearing aid and the most discreet hearing aid option. It is the most compatible hearing aid for telephone use, and can be used under a headset if necessary.

*Disadvantages:* There is room for a single microphone only, which means that the CIC hearing aid does not have directional and zoom microphones to assist hearing speech in a noisy environment.

It requires good dexterity to manage and it uses a small battery, which needs to be replaced more often. It may carry an additional cost because of the miniature size, making it usually a more expensive option than the other styles.

As a CIC hearing aid sits deeper in the ear canal, it is more susceptible to damage and may be a little less reliable as a consequence. If you have a very narrow ear canal, it may be difficult to fit a CIC hearing aid deeply (and discreetly) into the canal.

### ***In-the-canal (ITC)***

This hearing aid is slightly bigger than the CIC and cannot be seen from the front but may be noticed from the side.

*Advantages:* It is large enough to have controls such as a program switch, volume control and multi microphones. It is easier to manage in size and the battery size is bigger than the CIC battery, so that it will last longer.

*Disadvantage:* reasonable manual dexterity is needed to manage it and it may be prone to whistling when used on a telephone handset or mobile. However, many ITC aids now offer a special telephone program or induction loop setting to improve telephone communication.



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### ***All-in-the-ear (ITE)***

This hearing aid is bigger than the ITC, fills the bowl of the ear and can be easily seen from any angle.

*Advantages:* Its size can be helpful for people who have difficulty manipulating small objects. It uses a larger battery and can contain a more powerful circuit than the ITC size. As with the ITC size, it can carry multi-microphone technology.

Its *disadvantages* include the fact that it is relatively conspicuous and can still present difficulties on the telephone unless a special telephone program or induction loop has been incorporated.

### **One or Two Hearing Aids?**

Our brain is designed to integrate sensory information from both ears. If you have the same or a similar degree of hearing loss in each ear, then binaural (both ears) hearing aid fittings give the following advantages over monaural (one ear) hearing aid fitting:

- **sound localization:** You need binaural hearing, with an equal balance between ears, to determine where a sound originates. It is important to hear where warning sounds originate when driving, for example from fire trucks and ambulances, or for children on bicycles if you are on foot. A hearing loss often results in localization difficulties and while a binaural hearing aid fitting does not always restore this ability, it creates the best possible likelihood of it being regained.
- **greater speech understanding in noisy environments:** A large body of academic literature has shown that binaural hearing aid fittings give greater speech understanding in difficult listening conditions. In reverberant listening conditions, such as a restaurant, church, classroom or auditorium, a hearing aid fitting in one ear only will reduce your ability to understand words by 20 to 70%. We need sounds to have different arrival times and intensities before we can make sense of the multitude of sounds and voices in a crowded room.
- **consistent stimulation of the entire neurological auditory system:** Scientific studies have shown that the brain's ability to process what is heard deteriorates more rapidly without constant auditory stimulation. If you use a hearing aid on one ear, you may lose the ability to distinguish words clearly in the other ear. This is also a very good reason for not waiting until you absolutely need hearing aids before you get them.
- **reduced need for volume:** Binaural listening gives a loudness summation or boost of up to 6 dB. If you have hearing aids in both ears, this loudness summing capability means each hearing aid does not need to be turned up as much as it would be if used just on one ear.



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- **a built-in spare when a hearing aid needs repair:** Hearing aids are delicate electronic instruments, and break down every now and then. If you have one hearing aid, you may be forced to do without it for up to 10 days while it is repaired. We will provide you with a loan hearing aid, but it is not always possible to provide a hearing aid to match your own.
- **Overall:** you will be much better off with two hearing aids than with one. The disadvantage is cost, although we set our prices so that two hearing aids cost slightly less than double the cost of one hearing aid. If you are on a budget and are deciding between buying two moderately sophisticated hearing aids, or one highly sophisticated one, you may prefer to get the two moderately sophisticated ones.

### Digital hearing aid technology

Digital signal processing hearing aids are no longer a new innovation and are the primary choice of technology used today. With a digital hearing aid, the entire hearing aid circuit is a computer, which can be readily manipulated to suit your individual requirements.

#### *Computer Programmable Technology*

The hearing aid has a small port or entry point to which a cable is attached. This cable is linked to the computer, and each manufacturer has developed their own computer software to calculate how the hearing aid is programmed. This means that we can closely match your hearing aids with your hearing test results and hearing requirements, resulting in a highly personalized hearing aid fitting. If you prefer a different setting, or if your hearing changes, we have only to plug the hearing aid back in to the computer and make alterations to suit your needs.

#### *Automatic Volume Adjustment*

Hearing aids automatically adjust and set the required volume for each sound to provide sufficient volume for soft speech sounds, while at the same time restricting the amplification of louder environmental sounds. The computer chip in the hearing aid can make these adjustments up to 12,000 times per minute. It reacts quickly enough to turn the volume up for consonants, down for vowels, and back up again for the next consonant. It also reacts quickly enough to tone down slamming doors.

There is no need for a volume control, unless required for a fluctuating hearing loss or preferred by you. Setting the optimal amount of volume compression can take time. If not set correctly, sounds may appear muffled or harsh.

#### *Multiple Listening Programs*

If your hearing aid has a single response or program, we will have to compromise when trying to give you the best possible understanding in both quiet and noisy environments. Speech will be heard more clearly if the hearing aids can process sounds differently in noisier surroundings.



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Most hearing aids offer multiple listening programs for various listening environments (e.g. conversation in quiet, conversation in noise, comfort in noise, telephone, telecoil or induction pick-up, music, FM listening), which in most cases can be separately adjusted and fine-tuned. Many models automatically select the appropriate listening program depending on the noise level and types of sounds in the environment, automatically giving you the greatest clarity or comfort in different situations. You can choose to have one program customized for a special listening environment, such as your work environment, telephone or music/TV listening.

### ***Program switch***

A switch is fitted to the hearing aid to activate program changes, unless you select a hearing aid model that automatically selects the program for you. In that case, you can choose whether to have a program switch or not. If you prefer to let the hearing aid make the program decisions for you all the time, a program switch is not needed or can be deactivated. In reality, many people like the option of being able to override automatic program selection some of the time, requiring a switch.

Fitting a program selection switch means more space is required on the surface or faceplate of an in- the-ear hearing aid, and a greater degree of dexterity is required. If your hearing aid model does not offer automatic program selection, you will need to make the decision which program to use in each listening situation.

### ***Remote control***

Some hearing aid companies offer program and volume adjustment via a separate remote control. This can be used instead of, or in addition to, a programming switch and volume control positioned on the hearing aid itself. This can be useful for people with poor dexterity and those who prefer to maintain a higher level of control over the performance of their hearing aids.

### ***Multiple Channel Technology***

The primary purpose of hearing aids is to make speech intelligible. Vowels are moderately loud low frequency sounds, which determine the volume in speech, while consonants are soft high frequency sounds, which determine its clarity. So a hearing aid should give a small amount of amplification for vowels and quite a boost to consonants.

Additionally, most people have different degrees of hearing loss for different pitches (frequencies) of sound, with different amounts of amplification and compression required for the various frequencies. Based on these considerations, contemporary hearing aids divide the incoming sound into more than one frequency channel, processing these channels independently of each other. This is the concept of the multiple-channel technology, with each channel capable of being adjusted as part of the fine-tuning process.

Combining different rates of compression with multiple channels means better understanding, greater comfort, and less frequent volume adjustments. If multiple programs are also included, hearing aids can become very precisely tuned to your exact hearing needs.

### ***Multi-Microphone Technology***

Research has shown that the most effective way of improving the hearing of speech in background noise is to select a hearing aid with at least two microphones. One microphone



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picks up sound all around you (omnidirectional hearing) and is used in a quiet environment, while a second microphone picks up sound just in front of you (directional hearing) and may have the capacity to zoom towards a dominant voice. When used in a noisy environment, the background noise will be suppressed to the rear and side of you. This enhances the voice in front of you by improving the signal (the voice) to noise (background noise) ratio. To take full advantage of this feature, you need to position yourself with your back to the noise you don't want to hear.

Some models offer adaptive microphone directionality, with the hearing aid tracking the location of the noise and automatically limiting amplification from that direction.

Multiple microphones take up more space on the hearing aid, requiring a more visible aid size, so are not available in a CIC hearing aid.

### *Feedback control*

All hearing aids will whistle/feedback when they are being inserted and removed, if the mould is too loose or if there is a wax build-up. Thankfully, contemporary hearing aids are much more effective at controlling feedback the rest of the time so that frequently whistling hearing aids are no longer a significant problem.

### *Compatibility with telephones and personal listening systems*

Inexpensive, user-friendly devices are available to enhance hearing aid compatibility with telephones, mobile phones, MP3 players and television. Your needs in this regard will be discussed, and may influence your choice of hearing aid technology.

## **Making your choice**

**It can be confusing** to try to consider all the different forms of technology. We will discuss with you the different situations in which you need to hear well and the technology available to help give you optimal hearing at those times.

We will guide you to make an informed hearing aid choice, taking into account your communication needs, the required level of technological sophistication, the size and the cost. There is a broad range of hearing aids available, with six major companies to choose from. As an independent clinic, we have no association with any specific hearing aid manufacturer and make our recommendations based on the quality of the circuitry; the fine tuning capabilities of the computer software and the level of service provided by the manufacturer. In a highly competitive market, manufacturers are constantly refining hearing aid technology and design features, producing a new computer chip and hearing aid range about every 18 months to two years. While they are too expensive to replace so often, hearing aids are subjected to a considerable amount of wear and tear, and you need to be prepared to replace your hearing aids every 5 to 7 years.

Each manufacturer has a range of technical sophistication available in their hearing aids: from basic, least expensive technology to state-of-the-art technology at premium prices. There is no recommended retail price for hearing aids, and each clinic is free to set their own prices. We aim to make hearing aids as accessible as possible, by keeping our prices fair, and below the industry average. The costs range from \$1000 to \$5000 per hearing aid, and include a 1 year



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loss and damage (replacement cost \$150 - \$350) 2 year warranty on repair (longer warranty periods may be available at additional cost, and needs to be specified at the time of ordering). The level of technological sophistication should be matched to your communication needs, handling abilities and budget. If you rarely communicate in groups or significant levels of background noise, you may not require a sophisticated and expensive level of hearing aid technology. We recommend a mid-range level of technical sophistication and cost for most of our clients, providing good value without significant compromise in features and benefit.

### Finally...

Hearing aids cannot totally overcome the perceptual distortions caused by a hearing loss - they are an aid, not a replacement for normal hearing. We will give you personalized information of both the advantages and any limitations of hearing aid use generally, as well as with your particular hearing aid choice.

In summary, there are many hearing aid alternatives from which to choose.

You know best the situations where you want to hear better, the size and shape of hearing aid you will feel comfortable wearing and what your budget will allow. We will understand the type, pattern and degree of your hearing loss, and the technology to give you optimal amplification.

We are committed to making hearing aids as accessible as possible by keeping our prices fair, and offering you free of charge as many appointments as you will need after fitting.

### About our practice

**Wasatch Hearing and Balance** is a professional partnership of clinical Audiologists with post-graduate training in Audiology, who together offer extensive experience in hearing aid fitting/fine-tuning and rehabilitation.

Our philosophy is to provide audiological services in an independent private practice setting with strict consideration of the ethics involved.

We offer independent hearing evaluation, including hearing aid advice and fitting. Our aim is to provide the best quality care of all your hearing needs and to support you in adapting to your hearing aids.

We are located in American Fork, Heber, Provo, and St. George. Appointments may be made by contacting our practice at any time during normal office hours.