

How Hearing Aids Work

Why they help and how they keep getting better.



Digital makes a difference

The advent of digital signal processing revolutionized hearing aids, enabling scientists and manufacturers to write smart software and develop sophisticated algorithms that — to this day — lead to new benefits like:

- Improved speech understanding in noisy environments
- Increased gain without feedback
- Enhanced listening comfort and speech perception
- Ability to shape instrument settings to match the specific wearer's hearing needs
- More precise directional capabilities

Age old problem. Modern-day solution

Hearing loss has been around since the beginning of time. While it's difficult to pinpoint exactly when people began experimenting with ways to improve their hearing, (like using a cupped hand), we know that in 1588, Italian physician and scientist, Giambattista della Porta described early hearing aids in his published work *Magia Naturalis*¹.

Needless to say, hearing aids have come a long way since their early beginning. But the premise behind them, amplification, is still considered the best treatment for most types of hearing loss.

Batteries 101

Years ago, the hearing aid industry standardized batteries. Today, batteries come in four sizes, all with a corresponding (and standardized) colored tab. From smallest to biggest:

<i>Size 10</i>	→	<i>Yellow Tab</i>
<i>Size 312</i>	→	<i>Brown Tab</i>
<i>Size 13</i>	→	<i>Orange Tab</i>
<i>Size 675</i>	→	<i>Blue Tab</i>

How long batteries last depends on the hearing aid type, battery type, and the amount and type of hearing aid usage — but typically average 3-10 days for normal use.

An amp for your ear



In its most simple form, think of hearing aids as a miniature public address system with four basic components:

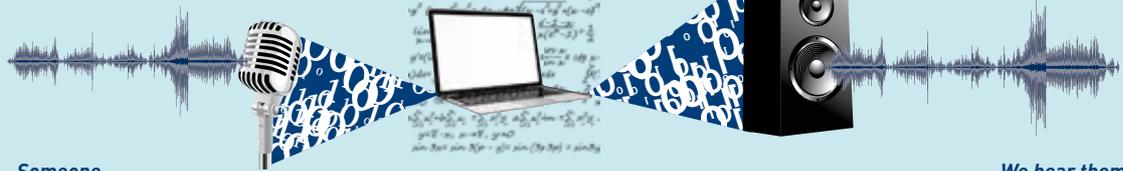
1. *Microphone*
2. *Amplifier*
3. *Speaker (receiver)*
4. *Power supply (batteries)*

No matter what style you get, no matter what size it is, all hearing aids consist of these four components.

Microphones and **receivers** are transducers, meaning they convert energy from one form to another. The microphone gathers acoustic energy (sound) and converts it into an electrical signal. The receiver gathers electrical signals from the amplifier and converts them back into acoustic energy (sound).

Located between the microphone and receiver, the **amplifier** increases the amplitude of the signal supplied by the microphone before transmitting it to the receiver, which sends it to your inner ear.

How Hearing Aids Work



Someone says hello –

*“ello ooreh
oooh ee
you en!”*

A microphone picks up the sound and converts it into an electrical/digital signal.

An amplifier increases the strength of the signal. In more sophisticated devices the signal is manipulated by advanced processing.

A receiver/speaker converts it back into sound and sends it to the inner ear.

The brain “hears” and understands the sound as speech.

We hear them say hello –

“Hello! It sure is good to see you again!”

For more details on how today's hearing aids work, talk to your hearing healthcare professional.



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