

# I don't need a hearing aid yet, right? Early intervention for hearing loss is key

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Hearing loss typically happens gradually over time—and yet, most

people don't see a doctor until the problem interferes with their daily life. But it doesn't have to be that way. Even if you're just starting to have trouble hearing what people say to you, it's important to know that hearing aids and devices have improved dramatically, and they can help no matter how mild or severe your hearing loss may be. People of all ages—even those in their 30s and 40s—have them, and many of these devices are now so small and discreet, they aren't noticeable.

"It's important for your [sense of hearing](#) to be as robust as possible, just like it is for your vision," says John Kveton, MD, chief of Yale Medicine Otology & Neurotology and Skull-Base Surgery—subspecialties focused on hearing and balance disorders of the ear, as well as the management of skull-base tumors and pathologies.

Because [hearing loss](#) is associated with social withdrawal, cognitive decline, and even dementia, it's important to talk to a specialist even if your hearing loss is mild, notes Dr. Kveton. The rate of hearing loss progression may be unpredictable, but, "the earlier we can intervene, the better chance we have of improving your quality of life," he says.

Perhaps surprisingly, the COVID-19 pandemic has brought more awareness to the problem of hearing impairment. "Hearing health is really having a moment now. Remote work during the pandemic has made communication more difficult, and people are realizing how fundamental their hearing is," says Yale Medicine skull-base surgeon Douglas Hildrew, MD. "If you can't hear someone on Zoom, you often can't do your job."

Technology is evolving so quickly that, in the past five years alone, there have been tremendous strides in the quality of hearing aids and personal amplifiers—not only are they smaller, but they also have superior sound quality, adds Arielle Feiman, AuD, a Yale Medicine clinical audiologist. "An example is Bluetooth connectivity. Users are able to stream via

Bluetooth to their smartphones, allowing for direct input from their [cell phone](#) to their hearing aids," she says. So, when the phone rings, they simply tap on it and listen to the caller through their hearing aid.

Bluetooth technology also extends to wireless streaming for other situations that have historically been problematic for those with hearing loss, including listening to music, hearing the television, and understanding speech in a meeting or classroom, she adds.

Our Yale Medicine doctors mapped out the latest hearing devices, breaking them down into three categories to help manage several kinds of hearing loss.

## Hearing aids

The latest hearing aids provide better natural sound, amplification, and elimination of background noise, says Yale Medicine otology & neurotology and skull-base surgeon Nofrat Schwartz, MD. "The technology of hearing aids is always advancing and getting better," she says.

There are many models available, and it's helpful to visit a practice that provides many options so you can choose the best one for your type of hearing loss and lifestyle concerns, Dr. Kveton says. For instance, you may want a device that can be tailored to your environment—you can put it on a quiet setting at home or you can set it to mask background noise in a restaurant.

- How they are worn: It depends on the hearing aid—you may get one that is worn behind the ear, in the ear, or in the ear canal.
- How they work: A hearing aid is a three-part, battery-powered system that includes a microphone, an amplifier, and a loudspeaker. Its job is to amplify sound. Sounds travel through

the microphone, which are then converted into electrical signals. The amplifier increases the power of those signals and sends them to the speaker, allowing you to hear them.

- Who they can help: Hearing aids can help anyone at any age, from infants to adults, for a wide array of different types—and severity—of hearing loss. Traditionally, they are used in cases of "sensorineural hearing loss," which is caused by damage to the small sensory cells (known as hair cells) inside the inner ear.
- Another thing you should know: Other listening devices—called assisted listening devices—can be invaluable companions to hearing aids. (Even people who don't wear hearing aids benefit from some of them.) These help with the management of everyday sounds. Examples are phone amplifiers, innovations that help with tinnitus relief, and flashing or vibrating alarm clocks or fire alarms. "This includes things that people with hearing loss, especially those with profound hearing loss, should be aware of for safety," Dr. Schwartz says.

## Bone-conduction devices

Bone-conduction devices—designed for people with a middle ear problem that interrupts the conduction of sound—have been available for years, but they too have evolved to include Bluetooth capabilities and other lifestyle improvements. "Some people have the previous generation of these devices with a fixture surgically implanted in the bone behind the ear, protruding through the skin to an external processor. A newer version is housed almost completely under the skin and is less conspicuous," says Dr. Schwartz.

- How they are worn: Small implanted devices work together with external components that are more or less visible, depending on the type of bone-conduction device you get. Previous-generation versions (that protrude through the skin) are implanted with a

surgical procedure that takes about 7 minutes. Newer options go completely under the skin, with a device worn behind the ear that pairs magnetically to the implant; this requires a 90-minute surgical procedure under general anesthesia. After about four weeks, the device can be activated and programmed to fit the patient's needs fairly quickly, Dr. Schwartz says.

- **How it works:** This is a sound delivery system. It transfers sound by bone vibration, bypassing the outer and middle ear. Through microscopic vibrations, it activates the hair cells of the cochlea—which is the organ of the inner ear that is responsible for hearing—to provide an extremely natural-sounding hearing solution.
- **Who it can help:** Bone-conduction devices are Food and Drug Administration (FDA)-approved for children 5 years and older, as well as adults, and they can help people with conductive and mixed hearing losses. A patient may have a congenital ear deformity, such as a missing eardrum or ear canal, or an infection may have caused conductive hearing loss. While the underlying problem can sometimes be resolved with reconstructive surgery, for many patients a bone-conduction device is very effective, Dr. Schwartz says.
- **Another thing you should know:** Doctors have started using bone-conduction devices in patients who are deaf in one ear, allowing for some compensation from the ear that can hear well. (In some cases, this is in combination with a hearing aid in the hearing ear.) Being able to hear with both ears is a vital part of our ability to locate sounds, as well as to understand speech and distinguish a speaker from ambient sound, explains Dr. Schwartz. "Sound coming in through one ear is not enough," she says. And unlike cochlear implants, which can require multiple visits to an audiologist for programming and fine-tuning, bone-conduction devices produce a natural sound quickly, Dr. Schwartz says. "It gets very close to normal hearing."



## Cochlear implants

Cochlear implants are yet another sound delivery system that is improving with time and technological advancements. While cochlear implants were initially designed for patients who were functionally deaf, they have evolved to the point where they are now the global standard for those with poor "speech discrimination," or ability to understand the spoken word.

Rather than hearing through a speaker, cochlear implants allow patients to hear by way of direct stimulation to the cochlea. "The biggest misconception with cochlear implants is that people think they provide only a monotone, robotic hearing experience," says Dr. Hildrew. "But they actually can provide a very pleasing hearing experience that hits all three dimensions of hearing—volume, pitch and timbre [the quality or richness of sound]."

- **How they are worn:** Cochlear implants have two components. The first component is the internal device, which is surgically implanted under the skin in a procedure that typically takes an hour and a half. The second component is the external device, which is worn behind the ear—similar to a classic hearing aid.
- **How it works:** An external sound processor detects sound and transfers it wirelessly through the skin to an internal electrode array that directly stimulates the auditory nerve, thereby sending sounds to the brain for processing. The sound bypasses damaged areas inside the inner ear and goes directly to the auditory nerve, where it provides electronic stimulation.
- **Who it can help:** These implants traditionally have been helpful only for people with bilateral, severe, or profound hearing loss, including children who were born with profound hearing loss or older people who lost their hearing later in life. Now, eligibility for both adults and children is centered around speech

discrimination. A person generally qualifies for cochlear implants once their speech discrimination falls below 50%. "At that point, hearing aids will have limited benefit because although they amplify sounds, they are unable to improve the actual speech clarity," Dr. Hildrew says.

Once the incisions are healed, audiologists work with patients to adjust volume and pitch, giving them a unique and personalized hearing strategy. After the initial activation, programming requires several visits scattered throughout the first year as each patient gets used to hearing sounds in a new way. "You don't need to learn how to hear again," Dr. Hildrew says. "It's more like making a new friend with a thick accent. Everyone is speaking the same language. You just might need to tell them to 'slow down' a few times while you are getting to know each other. But after a few months, hearing becomes more natural."

As with bone-conduction devices, cochlear implants can also help people with "single-sided deafness," or hearing loss in only one ear. This is the only way to rehabilitate the deaf ear, he adds. "We can adjust the cochlear implant to interact with a hearing aid in the other ear for a true bilateral hearing experience," Dr. Hildrew says.

Another thing you should know: Audiologists can sometimes adjust cochlear implants remotely, thanks to telehealth technology. Another thing to know is that there are newer-generation devices on the horizon that will soon give patients even more performance with their implants, explains Dr. Hildrew. For instance, implants will soon have small linear accelerators located within the external device. That will make it easier for someone to focus on the field of hearing in front of them, while minimizing sounds behind them—the devices will automatically adjust and self-correct each time a person turns their head. "It uses sophisticated algorithms and software programs to do that," Dr. Hildrew says.

Yale has been a pioneer in Connecticut with [cochlear implants](#), providing the first cochlear implant in the 1980s, Dr. Kveton says, and he expects Yale will provide new cutting-edge products in the next two years.

## Which hearing device is best for you?

Some people with mild hearing loss may find they do well enough with simple approaches, such as lip-reading or using closed captioning while watching TV. If that's not enough, Dr. Kveton suggests talking to both a specialist and an audiologist—the latter can provide additional support and will be adept at explaining the types of hearing devices and helping with any issues that come up.

Any [device](#) you get depends on the type of hearing loss you have, your lifestyle, and other factors, he says. "Some patients are born with severe hearing loss and need help early. Others develop it slowly over time. Obviously, as we age into our 60s, 70s, and 80s, the number of people with hearing loss that needs some type of management or therapy increases."

A simple first step is to get a hearing test—and take the results seriously, says Dr. Schwartz. "A lot of people don't treat their [hearing](#) loss, which is a mistake because it's a very important sense," she says. "Treating it is very important and should not be neglected."

Provided by Yale University

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