

# THE HERE & NOW *of Hearing*

By Rashad J. Gober

## *The Next Generation of Technology*

### New Developments in Cochlear Implants

*Cochlear implants, which are surgically implanted devices that provide direct electrical stimulation to the auditory nerve, may be an option for those with severe to profound hearing loss. In the past, the best candidates for these implants have been those with severe to profound sensory-neural hearing loss in both ears. However, with the development new technology, surgeons can now implant these devices in patients with unilateral sensory-neural hearing loss, also known as single-sided deafness.*

Certain physical changes associated with aging are more commonly accepted, or understood, than others. You can't see as well as you could when you were a teenager, aches and pains show up in places you never knew existed, and for some, hearing becomes an issue.

However, it seems that many older adults suffering from hearing loss are not seeking treatment. A recent Johns Hopkins study shows that only around 14% of adults ages 50 and up with hearing loss are actually being treated with hearing aids. This translates to roughly 23 million people with hearing loss who may need treatment.

Why aren't more older adults seeking treatment for hearing loss? Experts hypothesize that many think hearing loss is a "normal" part of aging, while others may not have health insurance that covers treatment costs. Besides these factors, hearing aids have always had a bad rap. No one wants to be the old guy with huge plugs in his ears and strange whistles and radio noises coming from him. Fortunately, the days of cumbersome, clunky hearing aids are long gone. New technology is making treatment for hearing loss more accessible to meet a wide array of needs.

### *Hearing Aids in the Digital Age*

Hearing aids differ based upon their circuitry. The conventional analog hearing aids that debuted in the '70s used vacuum tubes to amplify all sound (both speech and background noise) and a control wheel that allowed the user to adjust volume based on the environment. This kind of device with its vacuum tubes and heavy batteries is often what people initially think of when they hear the word "hearing aid." However, nowadays less than 10% of hearing aid users use this specific treatment option.





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# Invisible Technology

“Patients today have more options than ever when it comes to hearing technology—and many of the newer options are invisible. Two important developments in hearing technology are the Lyric® hearing device, which is placed deep in the ear and provides truly invisible hearing 24 hours/day, and the Esteem® fully implantable middle ear system. The Esteem® device relies on the patient's own ear anatomy, so the sound is very natural. Drawbacks from hearing aids such as feedback and background noise are typically not an issue.”



Megan  
Johnson, Au.D.,  
Johnson  
Audiology

Flash forward a few decades. Hearing aids are no longer obtrusive and noticeable. In fact, some are rather sleek. Most hearing aids today are digital, and even analog technology has greatly improved. For example, analog programmable hearing aids have a microchip that an audiologist programs for specific environments based on a user's hearing loss profile.

Digital programmable hearing aids are the most advanced kind of hearing aid currently available. These devices



employ all the features of the previously mentioned analog programmable aids, but also use digitized sound processing (DSP). DSP converts sound waves from a listening environment into digital signals, which are then read by a computer chip that determines whether the sound is speech or noise. The result is a clear, distortion-free sound. Digital programmable hearing aids also offer flexibility in hearing loss specific to the individual (i.e., they can be re-programmed as hearing improves or worsens over time) and offer better control of acoustic feedback—that annoying whistling sound often heard in conventional analog hearing aids.

Other improvements to hearing aids include:

**Directional microphones.** All hearing aids have a microphone to pick up sound. However, the problem with older hearing aid technology is that the microphones picked up all sound with-

out differentiating between background noise and the sound on which the user was attempting to focus. But now, an option called a directional microphone has improved the ability to hear in an environment with much background noise. This new technology, often used in conjunction with DSP, is designed to pick up sounds in front of you while reducing noise behind you, essentially mimicking what our ears already do.

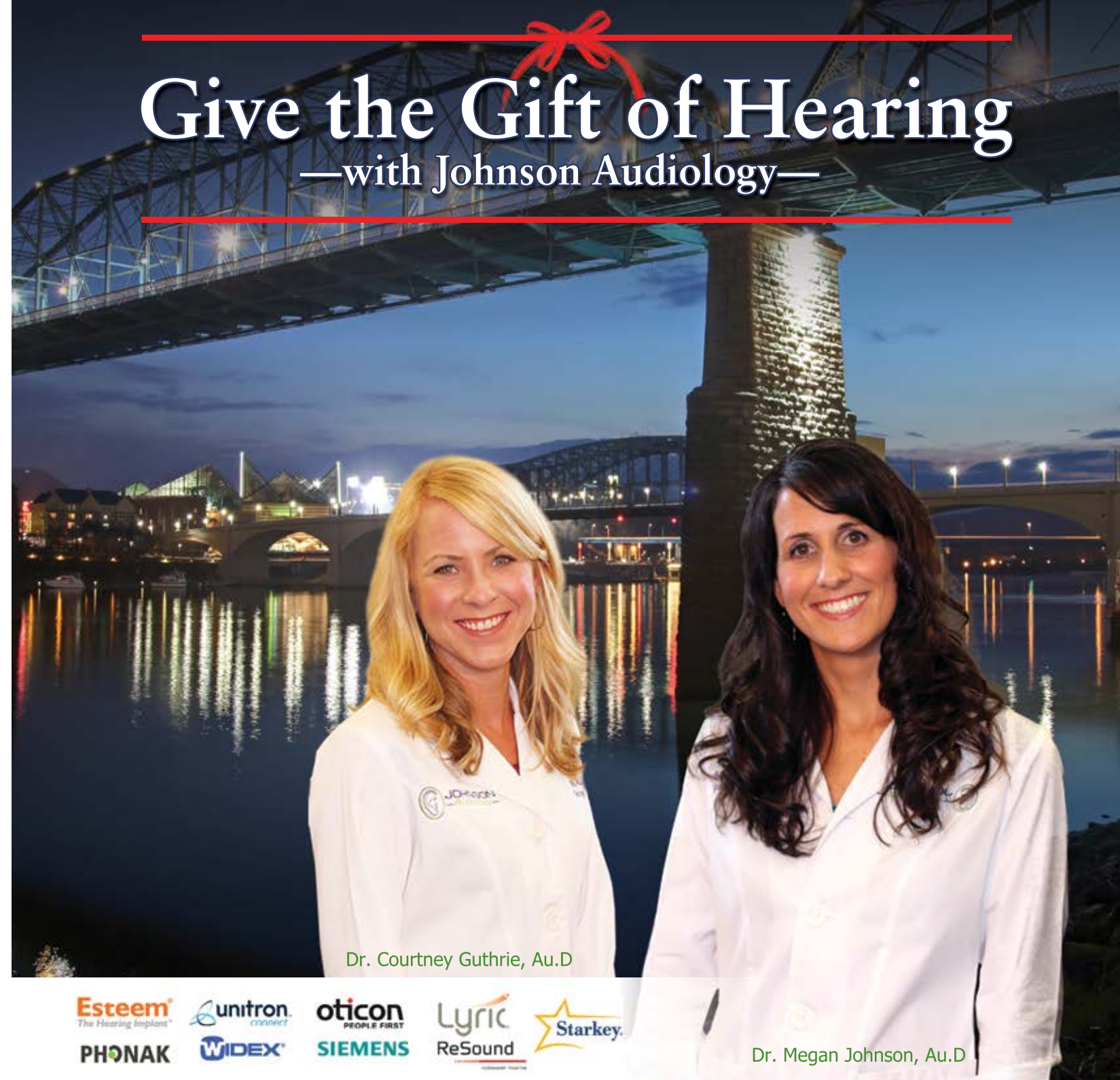
**T-coils.** A telephone coil, or t-coil, is a feature that lets you switch between a normal hearing aid setting and a telephone setting. This makes it easier to hear when talking on the phone by only receiving sound input from the phone and cancelling out other background noise.

**DFR and DNR.** Digital feedback reduction (DFR) technology in hearing aids monitors for feedback and cancels it out. Digital noise reduction (DNR) is a hearing aid option to reduce



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Restoration

“Hearing aids won’t restore your hearing to normal, but they can significantly improve your hearing and quality of life. With the most recent advances in technology, an audiologist can program your hearing aids to bring your hearing as close to normal as possible. This allows for enhanced speech understanding and hearing in noise. It’s important for patients to discuss their options with an audiologist to ensure they have the most appropriate technology for their hearing loss and lifestyle.”



Darnell H. Scafe,  
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gain (amplification) in frequencies where noise is detected with the goal of improving speech recognition.

And of course, these are just a few hearing aid options now available to meet a population with diverse and specific needs.

Assisted Listening—  
New Options

In addition to new hearing aid technology, there are also more assistive devices on the market today to help people with hearing loss communicate better. These devices are often used in conjunction with hearing aids.



One less expensive assisted listening device is the personal amplifier, which is a good option for quieter environments. This device increases sound levels for the user. The amplified sound is then picked up by a receiver and able to be heard through earbuds or headphones.

**Personal FM systems**, which use radio signals to broadcast amplified sounds, are commonly used in classroom settings. For example, the teacher will wear a microphone and the student will have a receiver set to a specific radio frequency. These systems are great for public places because radio signals are able to be broadcast over long distances.

For the smart phone-savvy, there are even hearing apps like **BioAid**, which suppresses some frequencies and amplifies others for the hearing impaired.

This app uses the phone’s microphone, audio processors, and earphones to help the user find a setting to suit his or her specific kind of hearing loss.

With all of the new technology and treatment options available, prospects are better than ever for the hearing impaired. If you are experiencing any kind of hearing loss, consider making the first step to talk with your audiologist. He or she can determine your level and type of hearing loss with a few diagnostic tests, and from there, you can begin discussions about treatment options and select the specific device to best suit your needs. There’s no reason why hearing loss should negatively impact your quality of life, and there is no time like the present to make a change.

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# Sounding Off on Speech Therapy

By Tinea Payne and Heidi Tompkins, Life Care Centers of America

**T**he ability to communicate and express ourselves is essential to connecting with others while having our own personal needs met. And although self-expression is a critical part of our lives, it is often taken for granted.

According to the National Institutes of Health, between six and eight million people in the United States are living with speech or vocal impairments. People living with communication-related conditions may feel silenced or experience frustration in overcoming the challenge in activities that many consider to be simple, day-to-day actions.

Fortunately, rehabilitation is available to help people living with speech-language problems to be heard loud and clear.

## What is speech therapy?

Speech therapy, sometimes called speech-language pathology, is a form of rehabilitation that addresses difficulty in communication. People experiencing issues with voice quality, stuttering, making certain sounds and hearing are often addressed by a specialist called a speech-language pathologist or speech therapist.

These professionals use a variety of therapy equipment and technological aides to help patients improve communication or provide

communication alternatives to connect with their environment more effectively.

But speaking is just a part of what speech-language pathologists can help patients accomplish.

“It’s so much more than just talking,” said Chad Higgs, director of rehab services at Life Care Center of Collegedale and a speech therapist. “We help people eat, talk and think – at all stages of life, from infants to the elderly. Speech therapy is so vast.”

As far as eating is concerned, speech therapists can help treat dysphagia – difficulty in swallowing food or liquids – with advanced muscle-stimulating technologies.

In addition, many health diagnoses impact not only a person’s body but also their thought processes. Speech therapists can help patients with cognition deficits by teaching them memory techniques and other treatments.

## Who needs it?

While speech, language, vocal and auditory problems are most likely detected at an early age, adults can develop these types of roadblocks, too. People living with a cognitive, hearing or speech delay or impediment are likely to see a speech-language pathologist, but individuals who have suffered from various conditions may also benefit, such as:

- Age-related hearing loss
- Alzheimer’s disease
- Neurological or facial injury or deformity
- Parkinson’s disease
- Stroke

Arun Biran, rehab director for Life Care Centers of America’s Cumberland Region

and a speech therapist for 22 years, shared, “Sometimes people give up because they think they’re never going to get better, but there is help out there.”

## Treatments in Speech Therapy

Speech therapists treat patients with a combination of physical and mental exercises, games, communication aides and testing, alongside advanced technological equipment, such as the VitalStim® Therapy System.

Patients who undergo treatment are evaluated throughout the process and given tools to help them continue improving their communication skills after therapy is complete. Speech therapists also provide tools for families, teachers and social workers, enabling them to assist communication-impaired people with interacting in their environment more comfortably and effectively.

The last few decades have seen the growth of research on speech therapy, as well as the rise of cell phone apps that help patients with articulation. Cochlear implants, esophageal prosthesis and other tools address all sorts of diagnoses and allow patients to be treated more easily.

“There’s so much technology that’s been able to make an impact on people’s quality of life,” Biran shared.

And no wonder. Perhaps Higgs put it best: “The heart of speech therapy is hope.”

Sources:

[nidcd.nih.gov](http://nidcd.nih.gov), [science.education.nih.gov](http://science.education.nih.gov), [vitalstim.com](http://vitalstim.com), [oig.hhs.gov](http://oig.hhs.gov)

## Speech therapists are trained to address:

- Speech and vocal impairments
- Swallowing problems such as dysphagia
- Cognitive impairments