

Hearing Health

Spring 2014

Get the Most Out of Your Hearing Aids

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See page 41



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Since 1958, Hearing Health Foundation has been the leader in preventing hearing loss and in funding research into advanced treatments. Now we are close to developing the first genuine cure for hearing loss and tinnitus by regenerating the damaged inner ear hair cells that make hearing possible. Help us making hearing loss and tinnitus a thing of the past at hhf.org/donate.

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1958

Collette Ramsey Baker founded Deafness Research Foundation to help further research and improve treatments for the millions of Americans with hearing loss.



1987

Funded research that discovered spontaneous regeneration of hair cells in chickens, thus igniting the field of hair cell regeneration in humans.

1960

Creation of the National Temporal Bone Banks Program, to collect and study the human temporal bone. In 1992 the registry was taken over by the National Institute on Deafness and Other Communication Disorders (NIDCD).



1990s

Advocacy for Universal Newborn Hearing Screening legislation increased testing from 5 percent to 97 percent of newborns by 2007.

1961

Honored Georg von Békésy with an achievement award in New York City, where he learned he had won the Nobel Prize in Physiology or Medicine

2002

Acquired Hearing Health magazine, the ultimate consumer resource on hearing.



2008

In celebration of our 50th anniversary, rang the opening bell at the New York Stock Exchange.



1972

Began funding research on cochlear implants. This remains a primary area of research funding, with later grants exploring single channel versus multichannel implants, speech perception among cochlear implant users, and implants for children.



2010

Launched Safe and Sound prevention program to prevent noise-induced hearing loss.



1977

Funded research in outer ear hair cell motility that led to a new method for measuring the health of a newborn's ear.



2011

Hearing Health Foundation became the new name for Deafness Research Foundation.



Launched the Hearing Restoration Project to develop the first biologic cure for hearing loss and tinnitus.

1985

Started funding research to understand how sensory cells transmit sound from the world to the brain, and began funding tinnitus research.



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NEWS



HHF's Melody Seiling shows musician Todd Rundgren how to protect his hearing at the NAMM conference in January.

Hearing Health Foundation and Westone Partner at NAMM Conference

Hearing Health Foundation (HHF) and Westone—the leader in high performance audio, in-ear monitoring technology, and hearing protection—presented a hearing health session for musicians at the National Association of Music Merchants (NAMM) conference in Anaheim, Calif., in late January. Attendees during the information session were eligible to win one of 10 Westone TRU Universal hearing protection earpieces. Westone also donates a portion of its sales to HHF through 2014. If you're in need of new ear gear, please consider Westone products and show your support for HHF.

The Carvel Foundation Makes a Gift in Support of Hearing Research

The Thomas and Agnes Carvel Foundation recently made a gift to HHF in support of hearing research. The Carvel Foundation historically supports causes that benefit children and identified hearing research as a critical need. Several Emerging Researchers are conducting studies on speech perception in children with cochlear implants and are working to identify genetic causes of hearing loss. HHF thanks the Carvel Foundation for its support.



The Royal Arch Masons' Edmund Harrison (center) presents a check to Rosalba Messina and Doug Olson of HHF.

Royal Arch Masons Renew Investment

In January, Edmund Harrison, M.E. General Grand High Priest of the General Grand Chapter of the Royal Arch Masons International, presented HHF with a very generous donation of \$100,000 in support of Emerging Researchers studying central auditory processing disorder (CAPD). For over 30 years, the Royal Arch Masons have supported CAPD research efforts, making it a priority to increase funds to this much-needed area of research. HHF is very grateful for the Masons' annual contribution.

Are You Set for Summer?

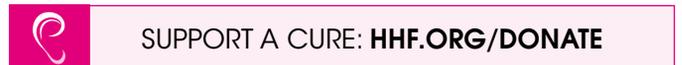
Before we know it, school will be out. Check out HHF's directory of hundreds of summer camps around the country for children and young adults with hearing loss at hhf.org/camps.

Find Hearing Health Magazine at Walgreens

HHF is thrilled to be working with Walgreens to distribute Hearing Health magazine for free in limited quantities at select Walgreens stores in New Jersey.

Save the Date

HHF's Junior Board will be holding its annual Summer Soirée benefit event on June 9 in New York City. Get details about what is sure to be another successful fundraiser for HHF at hhf.org.



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THEY SAID NOTHING COULD BE DONE ABOUT HEARING LOSS. GOOD THING HE DIDN'T LISTEN.

What drove Dr. Graeme Clark to invent the first multi-channel cochlear implant over 30 years ago? What kept him going when others called him crazy and sometimes worse? His father was profoundly deaf and growing up, all he wanted was to find some way to help. His invention came too late for his dad, but for the hundreds of thousands of people whose lives he helped change, it's been nothing short of a miracle. Let there be sound.

Today they can hear because one man chose not to listen. Read their stories at Cochlear.com/US/Hear. Or to connect with a Cochlear Concierge call 800-483-3123 or email Concierge@Cochlear.com.



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CAN TEMPORARY BLINDNESS HELP HEARING?

A child who is blind has a heightened sense of hearing—old wives’ tale, or fact? Fact. Researchers have shown that the brains of very young people can be rewired to better process certain sensory information. Now, researchers say the brains of adult mice can also be rewired to compensate for vision loss by improving their hearing. The so-called Ray Charles effect shows that minimizing a person’s sight for as little as a week may help improve the brain’s ability to process hearing.

Researchers at the University

of Maryland (UMD) and Johns Hopkins University published their study results in the journal *Neuron* in February. The scientists put adult mice with normal vision and hearing in complete darkness for 6 to 8 days. This experience had no impact on their vision, but testing revealed that the mice could hear much better than before. Research revealed changes to the cortex, a sensory processing part of the brain that is structured similarly in most mammals.

Although these mice reverted to their normal hearing after a few

weeks in the normal light-dark cycle, the authors are excited about the implications of their study. “This makes me hopeful that we would see it in higher animals too,” including humans, says UMD associate biology professor Patrick Kanold, Ph.D., one of the study authors. “We don’t know how many days a human would have to be in the dark to get this effect, and whether they would be willing to do that. But there might be a way to use multisensory training to correct some sensory processing problems in humans.”

HEARING HEADLINES



THE BIRD INNER EAR EXAMINED

Hearing Restoration Project (HRP) consortium members

Mark Warchol, Ph.D., of Washington University in St. Louis, and Michael Lovett, Ph.D., of Imperial College London, reported findings from the first comprehensive, large-scale analysis of the genetics of the chicken inner ear. Chickens and other birds can naturally regenerate hair cells that are damaged or die, restoring their hearing. The paper, published in the *Journal of Neuroscience* in March, discusses how this new genetic data set represents a greatly expanded, accurate, and highly complex genetic toolbox for additional investigations of sensory regeneration. It will also be invaluable for comparison with the mammalian inner ear, which cannot regenerate its hair cells,

making hearing loss permanent in mammals, including humans. Learn more about the HRP on page 40.



NIGHTTIME NOISE DANGERS

A University of Toronto study in the journal *Pediatrics* in March found that 14 commonly available white-noise machines used to aid infant sleep emitted sounds of more than 50 dBA (A-weighted decibels, a unit of measure for how humans perceive sound) when at maximum volume from a yard away. Three machines emitted 85 dBA, more than the workplace-safety limit.

Separately, Swedish scientists reported that rats exposed to moderate noise levels at night experienced permanent hearing damage, but rats who heard the same noise during the day did not. The study in *Current Biology* attributes the difference to a

hearing-protective growth hormone whose production is affected by circadian rhythms.

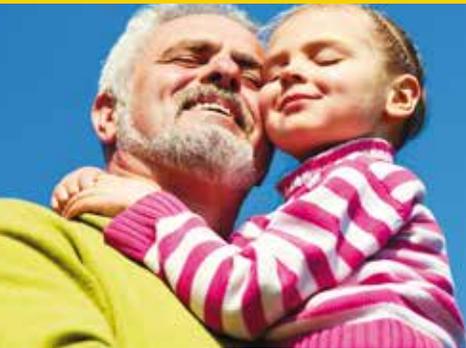


AIM TO AMEND MEDICARE

In the eyes of Medicare, audiologists are not in the same category as dentists or optometrists. The 18x18 Initiative seeks to change this by amending Title 18 of the Social Security Act (Medicare) by 2018. The goal is to achieve better access for patients and professional parity for audiologists. The proposed legislation allows audiologists to be recognized and treated under Medicare as they already are by most private insurers. To learn more about the reform effort, see 18x18.org. 



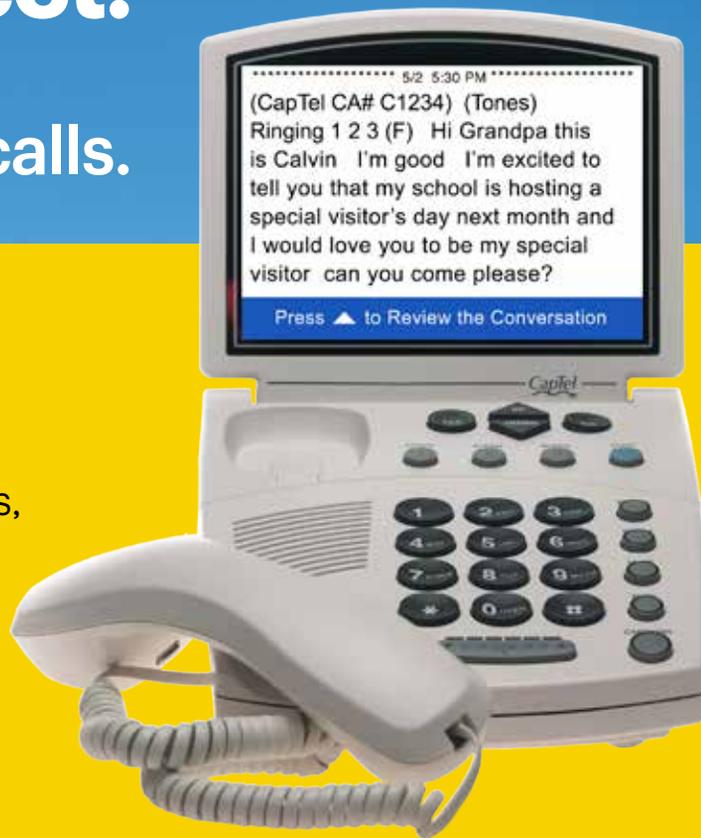
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All in Stride

Getting a hearing aid was as straightforward as going from working on Wall Street to staying home with the kids.

By Naomi Azrak

“MY HEARING LOSS HAPPENED seemingly overnight in my mid-20s. At the time, I was working on the trading floor of a Wall Street firm in New York City. As part of my daily business in sales, I was often simultaneously on two phone lines. Among the limited items on my slab of a desk were two phone handsets that took a beating.

When my right handset suddenly stopped working one morning, a tech support guy arrived quickly with a replacement. I called him soon after to say the new handset was also faulty. He returned with yet another handset, but this time he also checked the existing one. We argued, and he finally left me with a third handset. When I still couldn't hear with this one, I switched the handset from right to left ear and realized—uh-oh—that the handset worked, but my right ear didn't.

I was diagnosed with otosclerosis in my right ear. Otosclerosis is

a hereditary disorder causing progressive hearing loss due to the overgrowth of bone in the middle ear or, less commonly, inner ear. My hearing loss was defined as “moderately severe, sloping upward to mild”—which basically means I don't hear at all at the exact frequencies of my husband's voice. Soon after the diagnosis, I was hearing well with a completely-in-the-canal (CIC) hearing aid, which I have worn ever since (I am now 45).

Mind you, I am not wearing that same hearing aid; I'm on my fourth after a string of lost devices over the years. The loss of the first hearing aid—when my dinner host thought it was a piece of steak and threw it off the balcony of her New York City apartment—led to my special request of a blue hearing aid, which is the standard color of a left-ear hearing aid.

The standard red for a right-ear hearing aid looks too much like steak, and also, as it turns out, like mulch. My husband and I, along with our dinner hosts, dug for an hour in mulch beneath that apartment balcony looking for my red device. This color inconsistency never ceases to throw off audiologists, who continue to try to replace my aid in the wrong ear. (What may throw off other people is the idea of tossing a bit of meat off the balcony of a New York City apartment!)

I have long stopped working in an office, and I'm enjoying being home

with my kids, 9 and 11 years old. They're accustomed to the whistle of my hearing aid now and then and my occasional lack of response when I'm not wearing it. They even know where I keep my size 10 batteries in my pocketbook (and will replace batteries for me while I'm driving).

I've found my hearing loss to occasionally work in my favor—I can sleep with my good ear to the pillow to block out any noise, for example. But the flipside is that I couldn't always hear my baby crying, and I have slept through a buzzing alarm clock more than once.

I worry about my kids inheriting my condition as much as I worry about them inheriting my bad eyesight and bad teeth—which is to say, not a lot. Incidentally, I have no family history of otosclerosis, and even my identical twin sister's ears are both fully functioning. Even if my kids were to develop the same condition, I view my hearing loss as a minor disability and hope that they would feel the same. Honestly, it has little impact on my day-to-day family life, which is why I have chosen not to pursue a stapedectomy to correct my hearing.

I also haven't felt embarrassed about my small disability or need to use a hearing aid. I am grateful for modern-day technology and healthcare, which have not only allowed me good hearing (thanks to my hearing aid) but also good eyesight (thanks to Lasik surgery) and good teeth (thanks to braces). Now, if hearing aid manufacturers can just produce neon-colored or GPS-enabled aids, I'll be all set. 🦻

Naomi Azrak lives with her family in Connecticut.



The author with her family.

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How has deaf education changed over the years? How have advances in technology, changes in attitudes, and decades of research influenced how children with hearing loss learn and are taught? Hearing Health asked three respected, experienced leaders in the field to answer these questions.

Early and Experienced

By Susan Lenihan, Ph.D.

The educational experiences of children identified with a hearing loss today have changed dramatically from the experiences of children born a quarter century ago. Advancements in technology and approaches based on research have improved developmental and educational outcomes. Professionals often describe these changes as “early, early, early,” high tech, and evidence-based.

Today nearly 98 percent of all babies born in the U.S. are screened for hearing loss, versus fewer than 3 percent in 1993. The development of newborn hearing screening devices and the passage of the Early Hearing Detection and Intervention Act (EHDI) has led to a reduction in the average age of hearing loss identification to age 6 months in 2007 from 30 months in the 1990s. This identification of hearing loss in infants—thanks also in part to Hearing Health Foundation’s advocacy work in the 1990s—provides children with earlier access to listening devices and intervention services.

Listening technology (such as digital hearing aids, cochlear implants, and classroom audio systems) provides better access to higher quality sound at younger ages than ever before. Infants and toddlers can be fit with hearing aids during the first weeks of life. Research shows that when children with severe to profound hearing loss begin using cochlear implants between 6 and 18 months of age,

listening, language, and speech development improve.

Many children who learn to listen and use spoken language when they are young will receive educational services at their neighborhood school. Advances in sound field technology (a teacher using a microphone whose sound is transmitted to room speakers) and FM systems (a teacher using a microphone whose sound is transmitted into a receiver worn by a listener) provide needed support for students who benefit from enhanced sound from a distance and in noisy environments.

Early intervention services have become available for increasing numbers of children between birth and age 3. These services, funded through Part C of the Individuals With Disabilities Education Act (IDEA), provide audiology and educational services to children with hearing loss. Family-centered intervention services include counseling, coaching, and parent education as well as services to support early communication development.

The Neighborhood School

With the earlier use of listening devices and quality early intervention services, more families with children with hearing loss are choosing a listening and spoken language approach. Early intervention activities focus on listening and developing spoken language through daily routines and meaningful play. The professionals providing

Education Today

these services collaborate with caregivers to minimize the delay in spoken language development. Families often participate in support groups during this stage as well.

When a child reaches age 3, a multidisciplinary team, including the child's parents, develops an Individualized Education Program (IEP) that identifies strengths, weaknesses, goals, objectives, and needed services. Many children will receive early childhood education services in a school or center that specializes in working with children with hearing loss. In some cases the programs include having hearing peers in the classes to provide language models and to increase social interaction.

Some children attend public or private general education preschool programs. Ideally, professionals with the specialized knowledge and skills related to speech and hearing are available to provide services and support, as the early childhood years are critical for the development of listening, language, speech, and cognition.

Increasing numbers of children with hearing loss are receiving elementary and secondary educational services in their neighborhood school rather than in a specialized school for students who are deaf. Professionals including teachers of the deaf, speech-language therapists, and general education teachers monitor and support the child's academic achievement. Collaboration between these professionals and the child's audiologist is essential in reaching academic and communication milestones commensurate with hearing peers.

Children with hearing loss are expected to participate in the curriculum of the general education school to the fullest extent possible. Some students require an educational setting that provides additional support through smaller classes, differentiated instruction, and more time with teachers. These students may have been identified late, have other disabilities, or have grown up in environments that were less supportive of communication development.

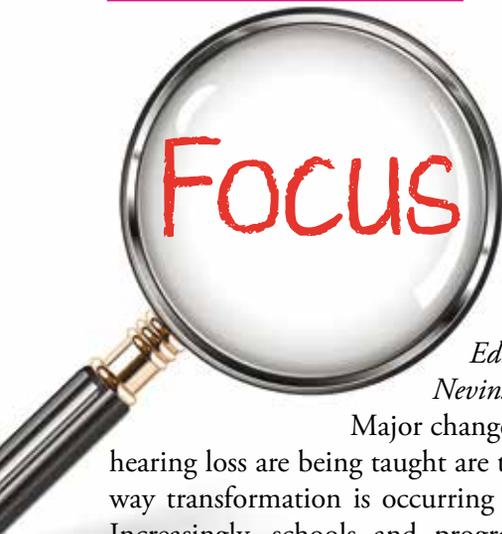
Teachers Near and Far

Advancements in professional preparation and collaboration have also improved the services provided to children with hearing loss. Collaborative preparation of educators and speech-language therapists with an emphasis on the use of listening technology for communication development is available in a number of programs, such as the federally funded programs at the Center for Teacher and Therapist Education at Fontbonne University in St. Louis. Professionals may earn advanced credentials, such as the Listening and Spoken Language Specialist certification at the Alexander Graham Bell Academy, by participating in professional development and mentoring and by passing a rigorous examination.

Another development is teleintervention, such as the "ihear" online therapy program at St. Joseph Institute for the Deaf, based in St. Louis. These programs support the achievement of children with hearing loss who live in places where there is a lack of highly trained professionals. Usually these weekly programs involve the use of a videoconferencing system with the trained professional in one location and the child and caregiver, teacher, or speech-language therapist in another, and they develop skills for both the child and the caregiver or professional.

Despite dramatic changes in deaf education in the past 25 years, family involvement in a child's education remains critical for successful outcomes. Research documents the importance of family involvement and early access to listening technology and qualified professionals.

Susan Lenihan, Ph.D., is a professor and the director of Deaf Education at Fontbonne University, in St. Louis, for teachers, speech-language pathologists, and early interventionists. With four decades of experience, she is now overseeing a project funded by the U.S. Office of Special Education Programs that prepares professionals to work as early interventionists or early childhood teachers in deaf education.



Focus on the Three T's

By Patricia M. Chute, Ed.D., and Mary Ellen Nevins, Ed.D.

Major changes in how children with hearing loss are being taught are taking hold in the same way transformation is occurring in education generally. Increasingly, schools and programs for children who are deaf or hard of hearing are losing their status as the primary educational resource.

Changes in technology and legislation for the identification of hearing loss at birth, coupled with access to spoken language through devices such as the cochlear implant, have created an environment in which an early intervention system emphasizes the family as the primary language teachers for children.

National efforts to engage and empower families to be their child's first teachers—regardless of whether that child has a hearing loss—open the door to the possibility that children with hearing loss born today will be kindergarten-ready, and as such, will be primed to learn with typically hearing peers. As children with hearing loss increasingly are mainstreamed, attending their neighborhood school, they are set to benefit from the same changes in education affecting all schoolchildren.

Traditional approaches to public education have focused on the three R's: reading, writing, and 'rithmetic. But now the three R's may be considered the three T's: teaching, technology, and transitions. This new construct is being adopted in classrooms throughout the U.S. in order to make educational outcomes consistent.

Teaching, the first T, serves as one side of the teaching/learning coin. Given the astounding rate of new knowledge creation, schools can no longer be tasked with simply transferring information. Rather, new teaching principles call for guided instruction to assist students in learning how to access an ever-expanding knowledge base. Once it has been accessed, students are asked to become consumers of knowledge and reflect upon it, reproduce it

in their own words, and then communicate it to others. As active seekers of knowledge, they are expected to take greater responsibility for completing meaningful tasks to apply their knowledge.

In problem-based learning experiences, creative solutions have more value than a single, predetermined, correct answer. Cross-curricular study through carefully planned projects encourages a multidimensional, hyper-connected perspective to learning. The new learning takes place in a collaborative context in which clear communication skills enhance the collective learning; children with hearing loss must have the support personnel to assist them in continuing to refine their kindergarten-ready language skills to fully participate and reach academic milestones through the primary, secondary, and college systems.

This learner-centered education is supported by the second T, technology. The incredible number of digital tools available for teaching and learning enhances the education of our 21st-century learners while at the same time also preparing them for later academic and career opportunities that will be driven by technology.

Mobile devices that provide access to the Internet (and as such are able to access apps, blogs, video chats, Google Docs, Facebook, Twitter, YouTube, the Teaching

Channel, and Pinterest) put the power of learning—and communicating that learning—in the hands of every student. In addition, technology expands the school day; learning can take place at any time or in any location.

The final T, transitions, becomes an important part of the educational process as children with hearing loss learn to move through the milestones of scholastic achievement. These transitions require the student to explore individual strengths and weaknesses as well as the ability to advocate for those services that will allow success. Individualized therapeutic interventions in the early years are replaced by academic tutors, study groups, and technological resources. As the student becomes more independent of the system, the system becomes more autonomous and

Today's focus
is on teaching,
technology,
and
transitions.

SARAH'S STORY



Sarah (far right) is an engaging 21-year-old with a severe to profound hearing loss. Born before universal newborn hearing screening, she wasn't diagnosed until age 11 months.

Sarah was fitted with hearing aids and began family-centered early intervention services by the time she was 1. Between the ages of 2 and 6, she attended St. Joseph Institute for the Deaf (SJI), where she received daily individual speech, language, and listening therapy from a speech-language pathologist. She also attended SJI's preschool and received educational services from a teacher of the deaf and audiology services from a team of audiologists experienced in working with children using hearing aids and cochlear implants (CIs).

When Sarah was 6, her parents, on the advice of professionals, decided that a CI would benefit her. Improved access to spoken

language allowed Sarah to develop better speech, language, and literacy skills. In first grade Sarah began attending her local public school and received support services from a hearing specialist and a speech-language therapist. "Sarah was fortunate to have the same hearing specialist for over a decade, and her general education teachers were very positive and accommodating," says Stacy, Sarah's mother (above, left).

As Sarah grew older, she took more responsibility advocating for herself including the use of her

CI. She did well academically and socially. "At times, I didn't want to use things like the FM system or preferential seating," she says. "But I knew that these services helped me with school."

She advises students with hearing loss to speak up for themselves and communicate with professionals to get the support that will allow them to be successful in school. "I also recommend students get involved in extracurricular activities. This can help you feel like a part of the school community," she says.

Sarah's story reflects how appropriate hearing technology, family involvement, and early access to services provided by skilled professionals can lead to success for children with hearing loss. Her enthusiasm, perseverance, and self-advocacy have also enhanced her achievement. Today Sarah is attending college and considering a career in business. —S.L.

global in teaching all students regardless of special needs.

Despite this futuristic and hopeful outlook, there remains a harsh footnote to this optimism: Children of poverty, children who fall through the cracks in the system, and children whose country of origin is not the U.S. or Canada may have performance trajectories similar to children born in the later part of the past century as opposed to the current century.

As a result, as systems gear up for novel possibilities for new learner-centered educational programming, this seems to come at the expense of providing an education that is individualized to a child who does not possess the precursor language skills to support subsequent learning. The field's next challenge is to determine how to support the needs of the kindergarten-ready children with hearing loss through an increasingly demanding education system, while also providing the more intensive direct instruction for children not yet prepared to meet their full educational potential in the general education classroom.

Children with hearing loss have never had more

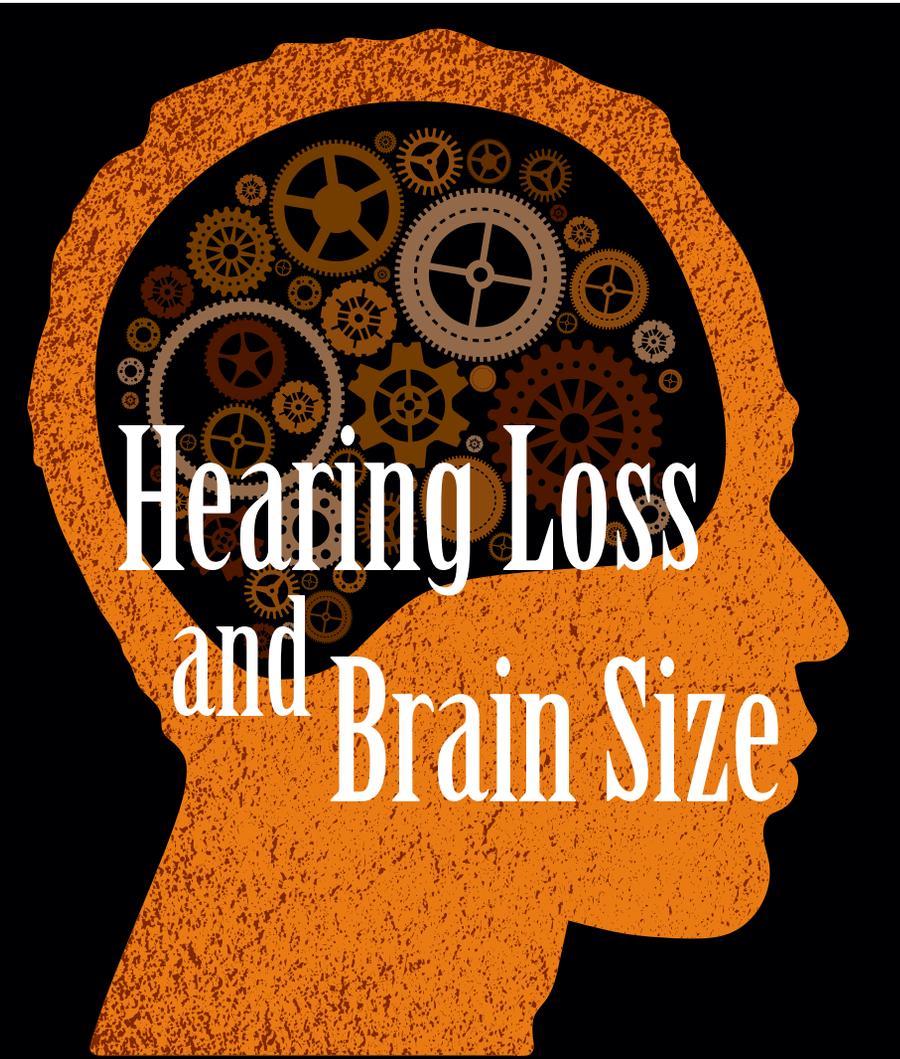
opportunities to learn in a manner similar to hearing children. The changes in education that are occurring ultimately benefit every child, including those with special needs. With great opportunity comes great responsibility to ensure that all children have access to instruction and, in the long term, are prepared for careers that enable them to be active citizens in society. 

Patricia M. Chute, Ed.D., is the dean of the School of Health Professions at the New York Institute of Technology. She has more than two decades of experience as a key player in medical and deaf education, particularly for children who use cochlear implants (CIs).

Mary Ellen Nevins, Ed.D., is the national director of Professional Preparation in Cochlear Implants (PPCI), headquartered at the Children's Hospital of Philadelphia. She is an experienced teacher educator and teacher of children with hearing loss, especially those using CIs.



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Hearing Loss and Brain Size

A new study finds that brain shrinkage is the latest in a list of health problems associated with hearing loss.

We thank Johns Hopkins University for allowing us to reprint the following press release about Frank Lin, M.D., Ph.D.'s study, "Association of Hearing Impairment With Brain Volume Changes in Older Adults," which appeared online in the journal Neuroimage in January.

Although the brain becomes smaller with age, the shrinkage seems to be fast-tracked in older adults with hearing loss, according to the results of a study

by researchers from Johns Hopkins and the National Institute on Aging. The findings add to a growing list of health consequences associated with hearing loss, including increased risk of dementia, falls, hospitalizations, and diminished overall physical and mental health.

For the study, Frank Lin, M.D., Ph.D., and his colleagues used information from the ongoing Baltimore Longitudinal Study of Aging to compare brain changes over time between adults with normal

hearing and adults with impaired hearing. The Baltimore Longitudinal Study of Aging was started in 1958 by the National Institute on Aging to track various health factors in thousands of men and women.

Previous research from other studies had linked hearing loss with marked differences in brain structure compared with those with normal hearing, both in humans and animals. In particular, structures that process information from sound tended to be smaller in size in people and animals with impaired hearing.

However, says Lin, an assistant professor at the Johns Hopkins University schools of medicine and public health, it was unknown whether these brain structural differences occurred before or after hearing loss.

As part of the Baltimore Longitudinal Study of Aging, 126 participants underwent yearly magnetic resonance imaging (MRI) to track brain changes for up to 10 years. Each also had complete physicals at the time of the first MRI in 1994, including hearing tests. At the starting point, 75 had normal hearing and 51 had impaired hearing, with at least a 25-decibel loss.

After analyzing their MRIs over the following years, Lin and his colleagues say those participants whose hearing was already impaired at the start of the sub-study had accelerated rates of brain atrophy compared to those with normal hearing.

Overall, those with impaired hearing lost more than an additional cubic centimeter of brain tissue each year compared with those with normal hearing. The scientists reported their findings in a study that appeared online in the journal Neuroimage in January.

Those with impaired hearing also had significantly more shrinkage in particular regions, including the superior, middle, and inferior temporal gyri, which are brain structures responsible for processing sound and speech.

The fact that structures responsible for sound and speech are affected in those with hearing loss wasn't a surprise, Lin says. Shrinkage in those areas might simply be a consequence of an "impoverished" auditory cortex, which could become atrophied from lack of stimulation.

However, he adds, these structures don't work in isolation, and their responsibilities don't end at sorting out sounds and language. The middle and inferior temporal gyri, for example, also play roles in memory and sensory integration and have been shown to be involved in the early stages of mild cognitive impairment and Alzheimer's disease. "Our results suggest that hearing loss could be another 'hit' on the brain in many ways," Lin says.

This latest study adds urgency to treating hearing loss rather than ignoring it.

"If you want to address hearing loss well, you want to do it sooner rather than later," Lin says. "If hearing loss is potentially contributing to these differences we're seeing on MRIs, you want to treat it before these brain structural changes take place."

Lin is examining whether treating hearing loss early can reduce the risk of associated health problems. He is the principal investigator for the SMART study (Studying Multiple Outcomes After Aural Rehabilitative Treatment), which kicked off in 2011. The study will examine older adults (age 50 and older) who are receiving a hearing aid or cochlear implant.

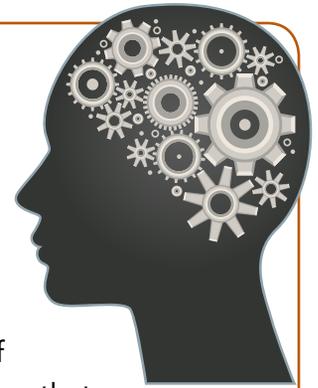
The primary goal of the SMART study is to evaluate the cognitive abilities of study participants before and after treatment, in addition to other measures of social and physical functioning.

For example, it will measure whether treating hearing loss can lower stress levels associated with hearing loss, via measurements of the stress hormone cortisol in hair and saliva samples.

Also, since Lin's research has found that people with hearing loss are more likely to fall and have problems walking, participants will be asked to walk and stand, occasionally while performing cognitive tasks.

To learn more about the research and ongoing studies, please visit Lin's website at linresearch.org and the website for Johns Hopkins Medicine at hopkinsmedicine.org.

Hearing Loss and Healthy Aging



This was the theme of the two-day Institute of Medicine (IOM) workshop that Frank Lin, M.D., Ph.D., co-chaired in Washington, D.C., in January. The workshop dovetailed with research areas that Lin's team has been investigating, including the consequences of hearing loss for older adults; how hearing loss can be most effectively addressed in the community; and the impact of treating hearing loss on older adults. We hope to feature some of the findings of the IOM workshop in a future issue of Hearing Health.

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Nuts-and-Bolts



Answers

to Real-Life Hearing Aid Questions

Staff writer Barbara Jenkins, Au.D., BCABA, shares concrete advice and sample scenarios—based on her more than 25 years of hospital and clinical experience—to help you choose the best hearing aids for you.



If three people with the same audiogram results walk into my office, I can guarantee that they will leave with three different hearing aids with three different settings. Every individual's needs, lifestyle, budget, and health considerations should all factor into the decision process about which hearing aids to get. But all too often these critical factors are not taken into consideration.

Arm yourself with a little information before purchasing. How you hear—every hour of every day for years to come—depends on it. Here are common scenarios to help you make a choice.

"I'm on a budget and can't afford the hearing aids my specialist recommended. How can I get a pair of affordable hearing aids without compromising on sound quality?"

Improved basic aids: Most hearing specialists want you to purchase the highest level of hearing aid because

you will probably be more satisfied with its sound quality. But even a mid-level hearing aid today is more advanced than the highest level of hearing aid just a few years ago. A basic hearing aid (which starts at about \$1,000) can be programmed to your hearing loss and comes in all styles. No, they will not have as high fidelity or be as flexible as the pricier options, but any hearing aid is better than no hearing aid. If your specialist tries to get you to purchase hearing aids you can't afford, go elsewhere.

Reconditioned, donated devices: Ask about options to help you pay for good-quality, reconditioned hearing aids. Many charitable clubs (such as Sertoma and Lions) have hearing aid banks with donated hearing aids. At our office we fit at least one person every month with hearing aids from our own hearing aid bank, and most of the hearing aids are no more than three to five years old.

Financing options: Options such as CareCredit and Chase can help you pay for hearing aids. They may offer up to 12 or more months of no interest. Ask your hearing

healthcare provider about available financing options.

“I’m active and enjoy outdoor activities. Which hearing aids or accessories are best for me?”

Devices for active lifestyles: Phonak, Siemens, and Starkey all have highly rated water- and dust-resistant hearing aids. Perspiration, rain, and an occasional accidental drop into water won’t harm them. If you want to snorkel, water ski, or swim while wearing your hearing aids, the Siemens Aquaris behind-the-ear (BTE) aid may be best for you. There’s no need to remove the Aquaris; just dive right into the pool. The cost is comparable to Siemens’ other hearing aids. You can also use water-resistant covers, such as those by Ear Gear. There are many styles and sizes, so ask your professional for advice.

Retention/security: Gracie is an Olympian in judo. She had difficulty while training because her hearing aids kept falling off when she was thrown onto the mat. She now wears Phonak Lyric hearing aids, one of the new mini completely-in-the-canal (CIC, also known as invisible-in-the-canal, or IIC) hearing aids. They fit deeply enough to be secure for the more active person. The Siemens Eclipse and Envoy Esteem are others in this category. (I wrote about IICs in Spring 2012’s “Mini Gems,” at hearinghealthmag.com.) A rock-climbing patient uses the sport clip accessory for his Siemens Aquaris. Huggie Aids hearing aid retainers or headbands attach BTEs more securely to the ear. These are especially good for children.

“My child needs hearing aids. What features should we look for?”

Audiologist input: In most states only an audiologist is legally allowed to fit a child with hearing aids. This is because there are specific acoustic considerations to make sure the child’s smaller ear canal resonance and speech enhancement protocols are closely followed. The physiology and physics behind hearing aid fittings must be taken into account to prevent additional hearing loss.

Parent/teacher controls: Most hearing aids now have remote controls that are invaluable for pediatric fittings. These allow adults to adjust settings while making sure the child doesn’t tweak them himself. Also, ask about special settings for noisy classrooms and quiet environments.

Security/durability: Most pediatric hearing aids are water- and dust-resistant. Tamper-resistant battery compartments—a must—are usually standard as well. It’s a good idea to get hearing aids in bright colors so they are easy to spot—the standard beige color matches playground sand! Brightly colored retention cords will help prevent loss. Other options—such as FM or

Bluetooth capabilities and telecoils (T-coils)—should be discussed with your pediatric audiologist. Make sure that the warranty and insurance are up-to-date, too.

“I have a severe-to-profound hearing loss. Is there anything new for me?”

Power: It’s amazing how much power we are able to get into hearing aids now. Smaller receiver-in-the-canal (RIC) hearing aids can have up to 75 decibels of gain—unheard of even a few years ago. While even some CICs can pack enough power for a severe hearing loss, if your loss is truly profound, the standard BTE may still be your preference.

Clarity: You may have a hearing loss where you hear lower frequency sounds but have profound damage in the higher frequencies. Widex, Siemens, Phonak, and other manufacturers have hearing aids that are able to take high frequency sounds outside your range of hearing and move them to an area of your cochlea where you can hear them. This technology has enhanced clarity of speech for many who would otherwise live in a world of muffled sounds, no matter the volume. (As hearing aid wearers know, just turning up the volume doesn’t make it clearer.) Although it may take some time to adjust to the way the new *S*, *F* or *TH* sound, your brain will use the extra information to help you interpret speech better.

Accessories: FM, Bluetooth, and T-coils (to use with hearing loop systems) should all be used to maximize speech in difficult situations. Apps for smart phones let you adjust your settings without touching your hearing aids. Whether you are at church, a theater, watching TV at home, or using your cell phone, these technologies help you to hear in stereo with all the background removed. Ask your professional which accessories may be able to help you, and their relative costs. (See “Must-Have Hearing Aid Accessories,” page 38.)

Cochlear implants: The guidelines for cochlear implants (CIs) are loosening as the benefits of their use are verified and technology improves. Consider one of the new hybrid CIs if you have normal low frequency hearing. They can bring back the ability to hear higher frequencies. (For more about hybrid CIs, see Winter 2014’s “Turning Pixels Into Pictures,” at hearinghealthmag.com.)

“My mother is in a nursing home. What special considerations should I address?”

Labeling: I’ve been working in the nursing home and hospital industry for more than 20 years and have seen my share of lost and damaged hearing aids. Custom hearing aids should be made with the patient’s name on

the shell. The manufacturer will do it at no charge. For non-custom aids, you can have names engraved or applied with permanent marker onto the back of the devices. Labeling can save you thousands of dollars or hours of anxiety.

Safety cord: Similar to the ones used for glasses, brightly colored safety cords can be attached to almost any style of hearing aid. They connect a pair of hearing aids, or are attached to a single device. It's amazing how much easier it is to find a hearing aid when there is a neon orange cord attached! A word to the wise: These cords usually come with alligator clips to attach to clothing, but I remove these. Too many hearing aids are pulled out of a person's ears when a sweater or nightgown is removed by an unsuspecting nurse or family member.

Special settings: If your loved one is in a wheelchair most of the time, have your specialist add an omnidirectional setting in order to pick up sound from all directions. Typical settings reduce the sounds behind you for better face-to-face clarity, but that dampens the sound of the voice of the person pushing the wheelchair. (Some more advanced hearing aids automatically search for the primary speaker, no matter the direction, without having to push a button; if you can afford them, these will make life easier.) Also, if your loved one is using an oxygen tank, have the hearing aids adjusted to decrease amplification of steady-state soft sounds, so it doesn't interfere with speech.

Insurance/warranty: Double-check that the hearing aids have a warranty and loss and damage insurance. Check with the caregiving facility ahead of time to see if they will cover loss. It is a good idea to have the staff remove the hearing aids at night and place them in the medicine cart until morning. (If they are lost overnight, the facility is then responsible.)

The staff places them back in the patient's ears in the morning, and verifies that they are working condition. All

of the assisted living and nursing homes I have worked in have done this for their patients.

Frequent cleaning: No matter how much training I've given to caregivers regarding hearing aid care, this is one chore they usually will not complete, due to liability and high staff turnover. Have a family member check the hearing aids every week. They need to be brushed and cleaned, and the batteries must be changed. It's disheartening to see two perfectly good hearing aids in a patient's ears, but the batteries aren't working or they are completely plugged with wax.

Personal amplifiers: Sometimes if a loved one is too weak or loses their hearing aids frequently, personal amplifiers may be the answer. These headphone and amplifier devices are relatively inexpensive and easy to spot on the patient. When you or a staff member wishes to speak, just take the amplifier and speak into it. Your voice is sent directly into their ears. Order through your hearing provider, or try Radio Shack or Amazon.

Remember that your hearing loss is utterly unique. Helping to make it so are your lifestyle, needs, and budget, which is why your hearing professional should not treat your hearing generically. Be proactive in asking questions that address your particular needs so that you go home hearing your best, whatever your circumstances. 

Staffwriter Barbara Jenkins, Au.D., BCABA, is Colorado's first board-certified doctor of audiology. She has more than 25 years of hospital and clinical experience in treating patients with hearing loss. Jenkins serves as Colorado's professional state commissioner for the deaf and hearing impaired, and was awarded the 2010 Leo Doerfler Award for Clinical Excellence by the Academy of Doctors of Audiology. For more information, see advancedaudiology.info.

Your hearing loss is unique. Don't let it be treated generically.



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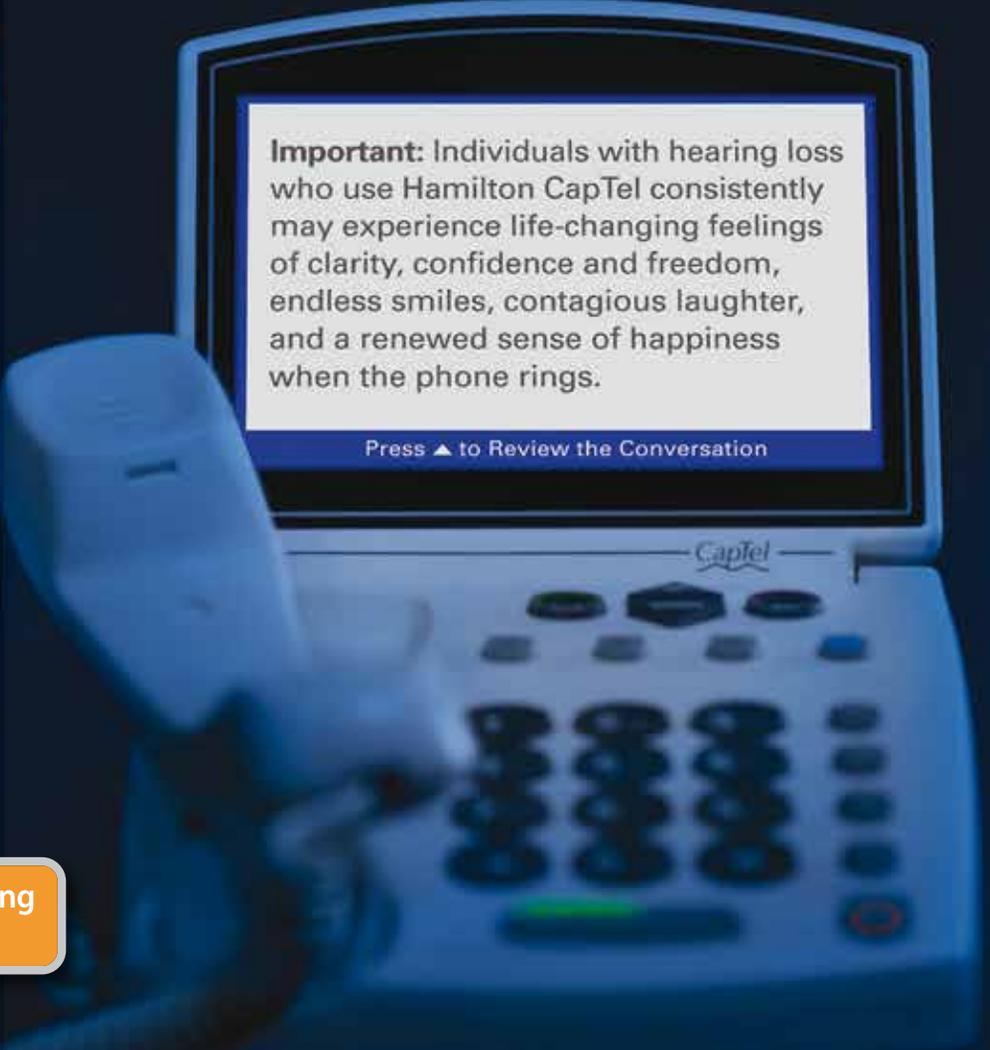
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Get the **MOST** **OUT OF YOUR** **HEARING AIDS**

We asked, you answered. We polled friends of Hearing Health Foundation—Facebook fans, board members, and magazine staffers and readers—to ask: How do you get the most out of your hearing aids? What do you wish you'd known before wearing them for the first time? How can you be sure you're getting the right ones for you? What are your favorite tricks to optimize their features? And—perhaps most importantly—how can you be sure the dog doesn't mistake one for a crunchy treat?

FIRST-TIME WEARERS

WEAR THEM! Don't put them in only for this or that occasion. Wear them consistently so that your brain has the best opportunity to learn how to process sound with the hearing aids. To fully acclimate to hearing aids, you have to leave them in. Getting used to them is a gradual process that may take several months.

—Joyce Morton, who has used hearing aids for more than two decades

CONSISTENT USAGE allows you the ability to teach your brain to process the sounds you need to hear versus noises you need to ignore. When I get repeat sensory overload I can tell I haven't been wearing mine enough.

—Lisa Renner Jackson, via Facebook

I'D HAD MY HEARING AIDS for several months but I decided when I did and didn't need to wear them. Seemed to be working well, until a friend pulled me aside at her party. She looked me in the eye and said, "Kathi, your *friends* really like it when you wear your hearing aids"—as if she was talking to a child. I got it. It was time to get my aids out of the dresser drawer and into my ears.

—Staff writer Kathi Mestayer

ALTHOUGH I WAS ENCOURAGED to wear two hearing aids at my first meeting with the audiologist, I chose to wear only one for many years. In my mid-30s at the time, I thought that if I wore two at that age, where would I be 20 years later? This was faulty thinking on my part. If I had to do it over again, I would have worn two hearing aids from the start in order to train my brain to experience the full range of sound.

—Holly Cohen, the president of the Hearing Loss Association of America's New York City chapter

PURCHASING

YOUR NEW DEVICES come with a trial period, which may be 30 to 60 days depending on which state you bought them in. Wear them as much as possible during this trial period. You'll have a better idea of what you like and don't like about the settings so your audiologist or hearing healthcare provider can best program your devices for you. Go on return visits frequently—about every two weeks—until you know if you plan to keep your device.

—Hearing Health editorial committee member Joscelyn

Martin, Au.D., an instructor in audiology at the Mayo Clinic in Minnesota

IT'S DIFFICULT TO PREDICT which aids will work for which people. Some do better with one particular manufacturer, others with another. That's the "brain" issue—it's not just a factor of the shape of your audiogram, it also has to do with the software in the aid itself, which varies by manufacturer and is proprietary. But don't be afraid to return them for any reason at all during the trial period. I've met a few people who were just too nice to take them back, not realizing that something like bad feedback is easily dealt with.

—Staff writer K.M.

WITH BOTH BEHIND-THE-EAR (BTE) and receiver-in-canal (RIC, also known as receiver-in-the-ear, RITE) hearing aids, you can try the device the same day you're tested, since no customization is required. This helps you to hear the sound quality before you have to make a purchase decision.

Some providers actually work for the hearing aid company they sell. This limits your options significantly. Get a second opinion from another provider. Choosing your provider is just as important—maybe more important—than choosing your hearing aid.

Use your flexible benefits account to help pay for hearing aids. Ask about money-back guarantees. And if you do upgrade, keep your old hearing aids as backup.

—Barbara Jenkins, Au.D., BCABA, staff writer

DON'T KEEP your hearing aids too long—seven years is about the max. Technology has made rapid advancements in recent years. Keep up to date, not only with hearing aids, but also with accessories such as Bluetooth devices that wirelessly connect your hearing aids to your cell phone, other audio devices, and landlines. They are inexpensive compared to the cost of the hearing aids, yet greatly extend hearing aid capability.

—J.M.

PROGRAMS AND SETTINGS

WORKING AT THE YMCA—with more than 12,000 members, lots of children, and numerous foreign-language accents—made it so difficult to understand what was being said to me. Now with a hearing aid setting to silence background noise, I can smile, hear, and understand with no struggle.

—DeLana Barron Sebright, via Facebook

THE MOST UNUSUAL of my hearing aids' settings is a zoom control setting, which enables the aids to zero in on a voice that is not speaking to me directly. Very useful for biking next to my daughter with her high-pitched voice or listening to my yoga instructor when he circles behind my mat.

—HHF board member Nancy M. Williams

I KEEP MY AIDS on a lower volume in a noisy environment or while I'm driving so that they are more comfortable. The digital aids also suppress the background noise. Just remember to turn it back to normal when out of the noisy environment.

—HHF board member Mark Angelo

I WEAR MY hearing aids for tinnitus. I have chimes that play and mask the noise I have that can drive one crazy.

—Peggy Geyer Kelly, via Facebook



BATTERIES

LET A NEW BATTERY sit for two minutes with the sticker off before putting it in the hearing aid. Some patients say they get an additional 10 to 15 hours out of a battery this way.

Also, stick the battery sticker on the calendar on the date you change the battery. Then you'll know how many days your batteries typically last.

—Editorial committee member J.M., Au.D.

CARRY SPARE BATTERIES with you always, not only when traveling! I was at a party once when the battery went dead and faced a long trek back to the car where I had left them.

—Tish Hamilton, a longtime hearing aid wearer

ZINC-AIR BUTTON batteries have been popular for hearing aids since the late 1970s. However, they contain mercury, so Illinois and some other states are now banning them. New batteries by Duracell, Energizer, Rayovac, and some other manufacturers are mercury-free.

—HHF board member N.M.W.



CARE

MOISTURE IS THE ENEMY of your hearing aids. I open the battery case whenever I take my aids off to help dry them out and to ensure that the aids are not

inadvertently still turned on and whistling. I always put them in a dehumidifying storage device overnight to ensure that any moisture is removed.

When a loud noise reduces the volume of the hearing aid, I have found that this can be because of moisture in the ear mold tube. Sometimes pinching the tube will work. Or I need to remove the ear mold from the aid and blow through the tube to get rid of the moisture.

During active sports that I know will make me sweat, I cover each of my aids with the cut-off finger of a surgical glove. I hold the surgical glove finger in place with a rubber band.

—HHF board member M.A.

I KEEP MY HEARING AIDS in the case they came in, with a desiccant bag (from another electronic device) to help sop up any moisture.

—Pam Jessurun Williams, via Facebook

HEARING AIDS can be annoying to wear in a noisy restaurant. Always carry a safe container—like a travel case—to put them in if you want to take them off. I've known at least one person who popped his hearing aid in his mouth after he put it on the side of his plate. (He thought it was a piece of bread.)

I myself have tucked them into my bra (strange look!), into my wallet (hearing aids and coins are not a good mix), and into my glasses case (and accidentally flung the hearing aid out when I went to get my glasses). I have also (but just once) left one on my bedside table. The dog found it a nice crunchy snack.

—Katherine Bouton, the author of "Shouting Won't Help"

YOU CAN WATERPROOF non-waterproof aids by using tiny sleeves, such as those from Ear Gear, over your hearing aid. And they come in bright colors, so they're easy to locate. Some of the sleeves also come with cords or tiny rings that you can use to attach your hearing aids to your shirt or glasses.

—Staff writer K.M.

FROM TIME TO TIME I may take off my hearing aids and put them down in a "safe place" but then forget where. I go crazy looking for them in a pure panic. Now I have designated safe places—covered bowls placed near my bed, couch, and piano—where I can put them. They can *only* go there. Saves me from pure panic!

—Pat Dobbs, the founder of the Hearing Loss Resource Center

WORKPLACE

“YOUR COMPANY should supply a telephone amplifier if one is needed (it’s required under the Americans with Disabilities Act). Sit up front or close to speakers in a large meeting. Sit directly opposite people you usually have the most trouble understanding in a small meeting.

Don’t hesitate to tell people that you have a hearing loss if you think the information will make it easier for you to communicate or prevent misunderstanding. It can help explain why you don’t respond or respond inappropriately to a question or comment because you may not have heard it.

—J.M.

IF YOU NEED hearing aids in order to perform your job, go to your local state vocational rehab office—that’s how I got help paying for mine.

—P.J. W.

I HAVE A SIGN on the back of my chair that says I am deaf/hard of hearing. When people read it they move to be in front of me and then talk.

—Dawn Collins, via Facebook

CHILDREN

“BTEs ARE THE MOST COMMON type of hearing aid for children, due to their flexibility and ease of upgrade. As a child grows, new ear pieces can be made without the expense of changing the hearing aid itself. Also, parents can better monitor usage because they’re easier to see.

—Staff writer B.J., Au.D., BCABA

TO HELP KEEP the hearing aid on our young son, we place a small piece of toupee tape on the back to secure it behind the ear. Such a big help with active kids!

—Michelle Conklin Bender, via Facebook

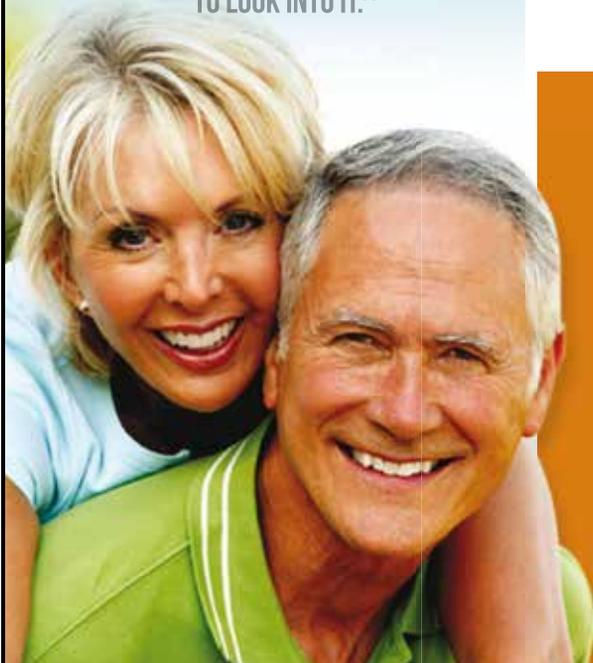
WHEN MY SON WAS 2 and got his hearing aids (pocket aids), I sewed pockets to his undershirts so they couldn’t be dropped. When he started using BTEs, I joined them with string and pinned them to his undershirt. This helped keep them from getting dropped, especially when he was crying and trying to yank them from his ears.

—Aliya Aamir, via Facebook 



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How Long Should My Hearing Aid Battery Last?

A seemingly simple question can be answered only when multiple factors are considered.

By Jenna Rebout and Ann Rule, Rayovac



One of the most common questions asked by hearing aid wearers is, “How long should my hearing aid battery last?” Although this may seem like a relatively easy question to answer, it is not.

First, it’s important to remember that no hearing aid wearer is exactly the same as another. Each individual has his or her own unique hearing loss, personal environment, hearing device, and usage patterns. These elements combine to form a hearing “fingerprint,” and no two are alike.

For this reason, it may be easier to understand why predicting hearing aid battery life can be difficult. Providing a universal answer to this common question is not realistic and can lead to disappointment or frustration.

To help understand the effects these factors have on battery life, let’s also cover the basics on how a hearing aid battery works. The batteries are very small, and manufacturers must fit all of the components required for

power into this small space. A solution to this challenge is zinc air, which has become the preferred chemistry for hearing aid batteries.

As the name implies, zinc air batteries use air as an active ingredient. These cells are designed with small air holes in the battery body, covered during the manufacturing process with an adhesive tab.

When this tab is removed, the chemical reaction begins, and the battery powers up. Since air is in the environment around us, it isn’t required to be put inside the battery. This allows for more space to be dedicated to elements needed to power the battery and make it last longer.

Because zinc air batteries are open to the air when in use, there are a few additional facts that hearing aid users should know. First, once the tab is removed, the battery life clock begins ticking. The cell is active and the chemical reaction is taking place.

Unlike other types of batteries, this reaction cannot be slowed or stopped—even if the battery is removed from the device or the tab is reapplied. You should always leave the tabs on your batteries until you are ready to use them.

In addition, since hearing aid batteries are using air

Important Battery Facts



There are many factors that affect how long a hearing aid battery lasts.

1 Degree of Hearing Loss

As the severity of hearing loss increases...

Increased amplification is required



Requiring more power from the battery



Reducing battery life



2 Battery Size

As the physical size of the battery decreases, the amount of space for the ingredients needed to power of the battery also decreases. Therefore, smaller battery sizes such as size 10 (yellow) and size 312 (brown) may have a shorter life than larger sizes such as size 13 (orange) and size 675 (blue).

Think of this like a car's gas tank. The bigger the vehicle, the larger the gas tank and the farther you can go before having to fill your tank again.



3 Hearing Aid Usage

It is common to ask other people how long their hearing aid batteries last. When comparing your battery life with the life that others receive, it is important to make sure you are using the same measurements to determine battery life.

Take these two things into account:

How many days a week do they wear their hearing aid?



How many hours a day do they wear their hearing aid?



4 Instrument Differences

Features in today's hearing aids—such as Bluetooth/wireless streaming, noise cancelation, and multichannel processing—can reduce battery life 20 to 300 percent!

This is like today's cell phones. Smartphones have Internet access, cameras, video, and apps that drain battery life faster than in older models.

Older phone, fewer features



Newer phone, more features



5 Environment



Low Humidity

As humidity is reduced...

- Batteries may dry out, reducing the battery life.



High Humidity

As humidity increases...

- Batteries may take on moisture, interfering with the natural discharge expansion, resulting in swelling/leakage and reducing battery life.



Temperature

As temperature is reduced...

- Hearing aid battery voltage is lowered and reaches its functional end point earlier, reducing battery life.



Altitude

As altitude increases...

- The percent of oxygen in the air is reduced. Remember that hearing aid batteries need air/oxygen to power up, so the reduction of oxygen may cause the battery to not fully power up and battery life to decrease.

The Bottom Line

There is no one answer on how long a battery should last that will work for all hearing aid wearers. The best way to understand what battery life you should expect is to keep track of the day you put in your hearing aid battery and the day you remove it. After you go through a package of batteries, you should have a better idea of the average time your battery should last.

as an active ingredient, the cell is more susceptible to the external environment. Humidity, temperature, and altitude are some environmental conditions that can affect how long a hearing aid battery lasts.

Hearing aid technology also factors into battery life. Today's hearing instruments are sophisticated—and, as a result, power-hungry. Hearing instrument manufacturers have added multiple features and accessories to new digital devices to accommodate the demands of hearing aid wearers. But these require a lot of battery power. For instance, many of today's instruments have accessory options that allow for wireless streaming of television and telephone audio. Although accessories of this type are very convenient for the hearing aid user, the added power required can significantly drain battery power. Be aware of this when using any advanced features or accessories with your hearing aid.

In addition to technological advancements, smaller devices are growing in popularity among hearing aid users. These also require smaller-size batteries. The smaller the battery, the less room there is for the components

Today's hearing aids are sophisticated and, as a result, power-hungry.

needed to power it, which likely results in a shorter battery life.

As you now can see, there are many more factors that affect how long a battery lasts. So how do you figure out what is normal for you? Keep track of the day you put in a battery and the day you remove the battery. Continue to track this pattern for an entire pack of batteries. Once you have used several batteries, you can average the amount of time each battery lasted and determine what you can expect going forward.

But remember, if you begin using new accessories for your current hearing aid or purchase a new hearing aid, the expected battery life is probably going to change. Start the benchmarking process again to determine how long your hearing aid batteries should last. 

Jenna Rebout and Ann Rule market hearing aid batteries for Rayovac, based in Middleton, Wis. For more information, see rayovac.com.

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Keeping You in the Loop



Hearing loop systems provide clear sound—free from background noise, echo, or distortion—directly into the majority of hearing aids.

By Elizabeth Stump

If you use a hearing aid, chances are you sometimes have problems hearing a speaker or other sound signal when in a noisy room, when auditorium or TV loudspeakers are far away, or when the room acoustics reverberate sound. Hearing loop systems are designed to solve such problems. Hearing loops, also called audio-induction loops or audio loops, are wires installed around the perimeter of a room, typically by the floor. Sounds from a microphone, a public-address system, or a TV feed into an amplifier through an electric current, and the amplifier sends the current to the wire.

The current creates a magnetic field, and this magnetic signal is then picked up wirelessly, like an antenna, by a

tiny copper telecoil (T-coil) receiver that is already built into most hearing aids and all new cochlear implants.

Relatively simple to set up, hearing loop systems transmit sound directly to your hearing aid. They reduce the work your brain must do while trying to make out sounds, since the T-coil picks up sounds only from the amplifier, instead of also hearing all the sounds picked up by the hearing aid's microphone. The result? Clear sound, free from background noise, echo, or distortion.

You may already be familiar with T-coils because all landline and some cell phones are designed to be used with them. About two-thirds of hearing aids have T-coils. Keep in mind the newest, smallest hearing aids may not have

T-coils, and some older, “automatic” T-coils are activated only by magnets in phone earpieces and won’t pick up room loops. Talk to your hearing provider to determine whether your aid has a T-coil and how to use it with a room loop. If your aid doesn’t have a T-coil—or if you don’t use hearing aids but want to take advantage of loop systems—you can use a headset that has a T-coil receiver in it.

Some hearing aids have a microphone as well as a T-coil setting. This allows you to hear via the loop system while still picking up ambient noise through your hearing aid’s microphone, such as if someone speaks to you or the phone rings. With some newer aids, your hearing provider may be able to customize your T-coil settings to your preferred balance between T-coil input and ambient sound.

David Myers, Ph.D., is the founder of Let’s Loop America, a Michigan-based nonprofit that has been leading the charge nationwide for installing and using hearing loop systems. “Hearing loop use is effortless and directly hearing aid-compatible, with no need to locate, check out, and return special equipment,” he says, referring to frequency modulation (FM) and infrared wireless systems that transmit signals to receivers with earphones.

The sound you hear is customized because you hear it through your own hearing aid, already optimized to your hearing. “Hearing loop systems are inconspicuous—an invisible solution to an invisible challenge,” Myers says.

The magnetic signal is universal and scalable, making it cost-effective for helping a large group of people at one time. There are also neck loops, “portable loops” that boost sound clarity even in facilities that are not looped. Plug the neck loop into the audio jack for a FM or infrared system or for a cell phone. From the audio jack plug-in, the neck loop delivers the signal to your T-coil.

Hearing loop systems can be used in venues as large as auditoriums or as small as your family room. They are used around the world—in fact, they are easier to find in public places in Europe. There the technology has been popular for decades because T-coils have long been standard in hearing aids.

In the U.S., the technology is still catching on, but more and more system installations are occurring every year, thanks to dedicated individuals and organizations throughout the country. Grassroots advocacy work like that by the Hearing Loss Association of America (HLAA) and Janice Schacter Lintz, the founder of the Hearing Access Program, means that New York City is one major U.S. city where you can find many hearing loop systems: at a growing number of train stations, museums, subway booths, Broadway theaters, supermarkets, pharmacies, libraries, and even taxis.

Juliëtte Sterkens, Au.D., HLAA’s hearing loop advocate, says some people believe that hearing loops and T-coils are an old, analog technology, and that better, new, digital wireless technology will soon be available. While Bluetooth wireless technology is helpful, it is designed for one-on-one conversation, it is not built into hearing aids, and the range is limited.

Sterkens hopes more hearing healthcare providers will promote the use of hearing loop systems. “Imagine if hearing care professionals around the country took an active role in their communities as hearing access experts?” she says. “If they set an example to help fund a hearing loop in their personal house of worship or their favorite community venue, hearing loops would quickly reach a tipping point.”

Laura Hansen, the founder of Assist2Hear, an assistive listening device company in Colorado, agrees that when it comes to induction loops, hearing is believing. “One of the biggest sales hurdles for churches, libraries, theaters, and government facilities—currently our largest users—is understanding the substantial marketing benefit that comes with installing a hearing loop,” she says.

Thanks to Myers’ work in Michigan, where the movement started, every church in the state is looped, Hansen says. (Places of worship, eager to help their congregations “hear the word,” were early adopters of loop systems, says Myers.) “An informal survey showed that it brought back an average of 10 families, proving a strong return on investment,” Hansen adds.

Ellen Semel, the former chair of HLAA’s NYC Loop Committee, says advocating for hearing loops involves convincing people how easy they are to use and how many people they can benefit. “Hearing loops are great assistive devices for those with hearing loss. Just push the button to get you to your T-coil mode and presto, you have Wi-Fi for your ears,” she says. “When installed correctly, hearing loops bring wonderfully clear, crisp sound while eliminating background noise. I love them.” 

For online hearing loop resources, including locations, see hhf.org/loops.

Staff writer Elizabeth Stump is the former editor-in-chief of the Hearing Loss Association of America’s Manhattan chapter newsletter.



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Looking for Hearing Aids? Find the Right Professional First.

By Kathi Mestayer

If you think you might need hearing aids, or if you haven't had your hearing checked recently, a good first step is to see a physician. The Food and Drug Administration (FDA) suggests visiting an ENT (ear, nose, and throat doctor, or otolaryngologist) when you first notice a hearing loss. This is so you can be sure there are no other medical conditions that could be responsible for the hearing problem, such as an ear infection.

If you need hearing aids, the doctor will suggest that you see an audiologist or a hearing aid specialist. These

are the two types of professionals who, by law, are allowed to provide assistance to people considering hearing aids.

Audiology training leads to a doctoral degree, abbreviated as "Au.D." A state license is also required, and professional associations provide additional certifications. Audiologists can diagnose and treat a wide variety of conditions, including all clinical aspects of hearing loss, tinnitus, balance problems, and auditory processing disorders. Audiologists are also the only non-medical doctor professionals allowed to work with hearing-related

conditions in infants and children.

Hearing aid specialists are also required to have state licenses. Most states require a high school (or high-school equivalent) degree, or an associate's degree from a two-year college. Some also specify specific coursework and experience. Specialists can test hearing; select, fit, and dispense hearing instruments; and counsel patients.

There is also certification for hearing aid specialists offered by associations, when the professional meets certain criteria. Hearing aid specialists are also known as hearing aid dispensers, hearing healthcare providers, hearing healthcare professionals, or hearing instrument specialists. (See "Alphabet Soup," page 36, for a guide to the meaning of various abbreviated certifications following providers' names.)

FINDING THE RIGHT PROFESSIONAL

In addition to your doctor's advice and the information above, here are some tips for deciding next steps.

Check licenses. Make sure the professional is licensed, and know what that license requires. The American Speech-Language-Hearing Association lists state-by-state licensing requirements for audiologists and hearing aid specialists at asha.org/advocacy/state/info.

Also check for complaints or case decisions, accessible via the Academy of Doctors of Audiology (ADA), at audiologist.org/publications20/state-licensure.

Make sure you have a choice. "Your provider should consider hearing aids from different manufacturers to help you choose what's best for you," says Hearing Health staff writer Barbara Jenkins, Au.D., BCABA. The magazine Consumer Reports agrees, advising on its website, "We consider it important to have some choice of hearing-aid brands, and independent providers generally carry two to four different ones."

Do some homework. "One of the best credentials, after licensing and education, is 'street cred,'" says Stephanie Czuhajewski, ADA's executive director. "Ask

people who know the professional about their listening skills, flexibility, follow-up, and interest in the patient's priorities."

"Patients searching for audiology services should visit the provider's

website, too, if possible," adds Paul Farrell, Au.D., CCA-A, the associate director of ASHA's Audiology Professional Practices group. Yet another source is the 2014 Consumer's Guide produced by the Hearing Loss Association of America (HLAA), available online at hearingloss.org.

Choose a convenient location. Make sure the location and office hours are convenient because you will need to make frequent follow-up visits to ensure the hearing aid is the right one for you. The fit will be adjusted and the programs and settings fine-tuned.

Read the fine print. Find out what standard terms are in the sales contract. Many states have contract requirements specific to hearing aids. Your state attorney general's office can tell you what rules apply. The Federal Trade Commission (FTC) suggests that a hearing-aid contract include the following items:

- **Trial period:** Most states require a 30- to 60-day trial period during which the hearing aids can be returned for any reason. You could find that despite follow-up visits, your hearing aid just doesn't have the right combination of software, features, or fit for you. Find out which fees are refundable if you return the aid during the trial period.
- **Warranty:** Ask about the length of the warranty and whether it covers maintenance and repairs. Determine if the office does walk-in repairs and if it provides loaners when needed.
- **Total price:** Check whether the price quoted includes testing and other services, in addition to the hearing aid. Sometimes the provider will include free future audiological tests, batteries, and repair in the purchase price.



ASHA's website has information on potential sources of financial assistance. Visit asha.org/public/coverage/audfundingresources.

Ask about follow-up services. You may need to do additional auditory training, develop listening strategies and speech-reading skills, or join a support group, like one offered by a local chapter of the HLAA.

"Our brains need time to get used to the additional volume and clarity that we get from hearing aids," Czuhajewski says. "It's not the same as getting used to eyeglasses."

If you are a veteran, find out whether you are eligible to get your aids at a Veterans Affairs facility. The veterans in a recent Consumer Reports survey gave the VA high scores for providing their hearing aids.



Before you buy a hearing aid, ask about the trial period, warranty, and which services, if any, are included in the total price.

Test the device, for real. In addition to audiogram and speech comprehension testing, the provider should conduct a “real-ear” test, which tests the hearing aid in the ear. “The real-ear test makes it possible to see if the aid is working as expected in the patient’s ear,” Farrell says. “The shape and size of the ear canal can actually change the sound characteristics.” Real-ear technology can be used with pure-tone as well as human speech input (speech mapping).

SOME FINAL NOTES

Do not buy hearing aids online. The FDA advises consumers that buying a hearing aid online or through the mail is risky because hearing aids need to be custom-fitted and tested to be sure they are working properly.

Avoid confusing PSAPs with hearing aids. Personal sound amplification products (PSAPs) are not hearing aids. “PSAPs are devices used by people with normal hearing to amplify hard-to-hear sounds,” according to the FTC. “For example, if you are sitting at the back of a lecture hall, eating in a crowded restaurant, or bird-watching, a PSAP may be helpful.”

Shop around, and use the trial period. If you’re not satisfied with a provider’s evaluation or policy on any of the points above, or you want to see what other providers offer, you’re entitled to a copy of your audiogram to use to shop around. And don’t forget the state-required hearing aid trial period. It’s there for a reason: to help guarantee complete customer satisfaction. 

Staff writer Kathi Mestayer serves on advisory boards for the Virginia Department for the Deaf and Hard of Hearing and the Greater Richmond, Va., chapter of the Hearing Loss Association of America.



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Alphabet Soup



It can be hard to make sense of the various letter combinations that follow a hearing professional’s name or that are used to establish credentials. Here’s a quick overview.

ABA: American Board of Audiology. Sets standards for audiology certification.

ACA: American Conference of Audioprosthology. A baccalaureate-level course for hearing instrument dispensers with two or more years of experience.

ADA: Academy of Doctors of Audiology. The professional association for doctors of audiology.

ASHA: American Speech-Language-Hearing Association. A professional organization for audiology and speech-language pathology practitioners. Provides credentials, advocacy, professional consultation.

BCABA/ABA: Board Certification from the American Board of Audiology. If you wish to see if your audiologist is board-certified, look for BCABA after their name, or visit the American Board of Audiology website to look them up.

CAA: Council on Academic Accreditation in Audiology

and Speech-Language Pathology. The accrediting agency for graduate education programs in audiology.

CCC-A: Certificate of Clinical Competence–Audiology. ASHA’s certification for audiologists. This is the entry-level certification most audiologists receive upon passing their national exam.

IHS: International Hearing Society. A membership association that represents hearing healthcare professionals and hearing aid specialists.

NBC-HIS: National Board for Certification in Hearing Instrument Sciences. An organization that provides credentials and support for hearing aid specialists.

BC-HIS: Board Certified in Hearing Instrument Sciences. The NBC-HIS certification program.

For links to various organizations, see [hhf.org/finding-a-hearing-health-professional](https://www.hhf.org/finding-a-hearing-health-professional).

—K.M.

Choose wisely.



Your selection of a hearing health professional is a decision that will have an enormous impact on your quality of life. It is important to find a board certified professional—one who has a proven commitment to professional excellence and integrity.

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Must-Have HEARING AID ACCESSORIES

Hearing aids are just the first step. To get the most out of them, accessories are key. They can greatly expand the capabilities as well as extend the life of your hearing aid. Here is our go-to list.



HEARING AID CARE

Batteries: Of course! Without charged batteries, your hearing aids won't work. Zinc air batteries, the dominant technology today, deliver reliable power in a compact size (above, left). (See "How Long Should My Hearing Aid Battery Last?" page 28).

Storage: Moisture is the enemy of your hearing aids. Overnight dehumidification is critical, such as via Dry & Store storage cases. Also helpful are travel-size dehumidifying cases, which are smaller and usually battery-charged or, like Dry Caddy, use a desiccant.

Sweatband/sleeve: Sleeves protect behind-the-ear hearing aids from moisture and dust. They can also help prevent loss, reduce wind noise, and prevent chafing. Ear Gear (above, center) and Hearing Aid Sweat Band both make them in a range of sizes and colors. Some come

with cords, to attach to glasses or shirts.

Wax traps/guard/filters, tube blower, and hearing aid brush: After a dead battery, wax buildup in your hearing aid is the most common cause of it not working. Your hearing aid likely came with cleaning tools; use them daily to keep the receiver (the hole in the shell of the hearing aid) and the rubber tube around it clean. Be gentle while cleaning, and follow manufacturer instructions.

ASSISTIVE TECHNOLOGY

Bluetooth: Phones are usually the first thing people think of when it comes to Bluetooth wireless streamers. But this is not Bluetooth's only use: It lets you stream one electronic device to another, such as your TV or MP3 player, directly to your hearing aids, without pesky cords. While the distance between the device and the hearing aids is limited to about 30 feet, the sound quality is very

good, and the cost is usually substantially less than FM. Remember that each hearing aid manufacturer has its own proprietary Bluetooth streamer, rendering the streamers incompatible with one another.

FM system: Frequency modulation (FM) devices are the preferred method for sending a teacher’s voice into a child’s hearing aid. The sound quality is very good, and the distance the hearing aid can be from the microphone is up to 90 feet. Technology has decreased the size of the microphone and receiver significantly, but it remains a significant investment.

Neck loop: This is a personal hearing loop system you can wear around your neck and use instead of earbuds, if your hearing aids have telecoils (see below). Once you have plugged it into the audio jack of a receiver for a smartphone, laptop, FM system, or MP3 player, the neck loop delivers sound directly to your hearing aid’s telecoil.

Personal microphones/amplifiers: These are mini microphones (opposite page, far right) that you can point toward a specific speaker, such as when you’re in



a noisy restaurant or a car. They can be used with a neck loop or earbuds.

Telecoil: When the telecoil (T-coil) in your hearing aid is engaged, sound is delivered wirelessly and directly into your hearing aids in public spaces that have installed hearing loop systems, such as movie and Broadway theaters and train and subway stations. (See “Keeping You in the Loop,” page 32.)

Hearing aid wearers who have tried loops, FM systems, and Bluetooth say the sound via loops is among the best of the options currently available. Most people use some combination of these technologies at various times, depending on what is available in public areas.

We have listed the T-coil here as an accessory as about two-thirds of hearing aids have them. Check with your hearing provider to see if yours do.

ALARMS AND PHONES

Amplified telephone: Dial down the frustration of talking on a phone with phones that raise the decibel level, allow you to adjust the frequency of the speaker’s voice, and work with hearing aids to eliminate feedback.

Captioned telephone: Calls received on captioned phones are transcribed in real-time, with the captions appearing on a large screen on the phone. Thanks to the Americans with Disabilities Act, the captioning itself is free; you just need a compatible phone, which can be corded or cordless (below, left). Veterans and people with financial need can often get a discount. Some captioning services display captions on a computer screen.

Vibrating/flash alarm clock, smoke detector, and doorbell: At night, when your hearing aids are removed, how do you hear an alarm? Vibrating alarms are one answer; the vibrating pad is placed under your pillow. Alarms that flash lights and gradually raise the decibel level of the alarms also help. Smartphone cradles that light up when a call or text message comes in are available

(below, center). Doorbells can be connected to indicators that flash lights. Some fire departments distribute free smoke detectors that use a range of frequencies to send an alert. (Learn more at online retailers such as Harc.com, Harriscomm.com, and Hear4You.com.)

AND DON'T FORGET

Hearing aid bling: Sure, these aren’t absolutely necessary, but adding a little dazzle to your devices will help personalize them and make them your own. Check the websites for Hayleigh’s Cherished Charms (above, right) and Adco Hearing Products for inspiration. 

—Staff writers Barbara Jenkins, Au.D., BCABA, and Kathi Mestayer; and editor Yishane Lee

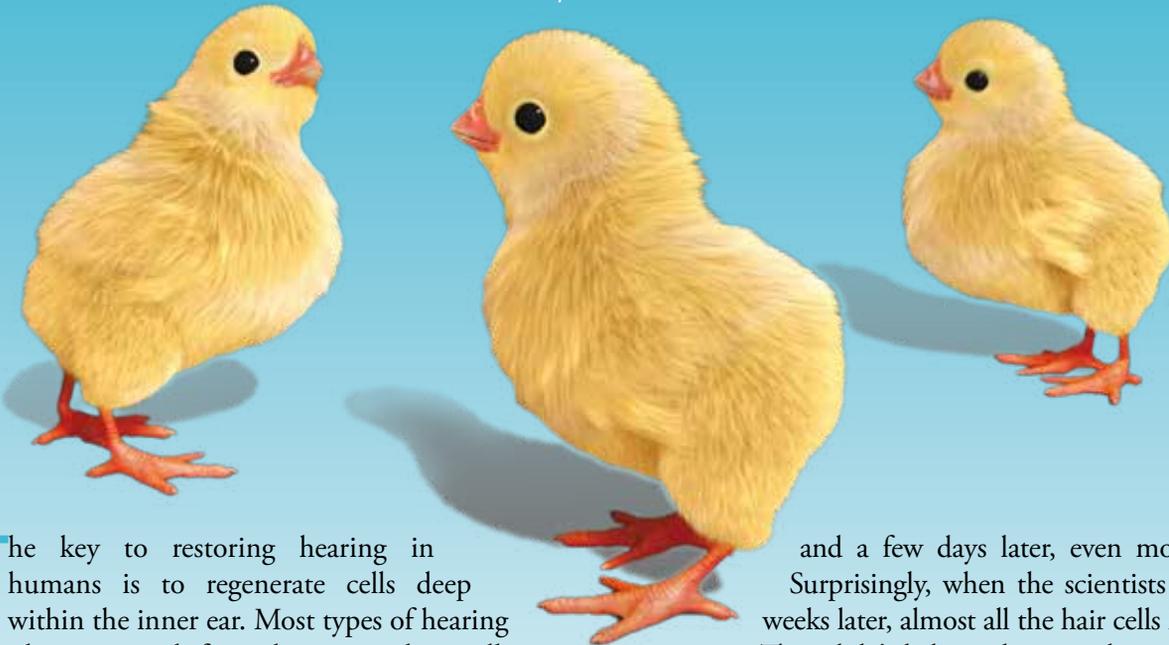


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AN EVOLVING PLAN

Scientific breakthroughs and evolving technology underpin the ongoing efforts of the Hearing Restoration Project, whose aim is to translate a chick's ability to spontaneously restore its hearing to humans.

By Shari Eberts



The key to restoring hearing in humans is to regenerate cells deep within the inner ear. Most types of hearing loss in humans result from damage to these cells, called hair cells. While humans cannot regenerate hair cells after they are damaged, chickens can. In fact, most animals other than mammals can regenerate these delicate cells, spontaneously restoring their hearing after damage.

The Hearing Restoration Project (HRP) is funding research to translate what we know about chickens and other animals to people, leading to a cure for hearing loss. With 90 percent of tinnitus (ringing in the ears) resulting from an underlying hearing loss, a cure for hearing loss will also be a cure for tinnitus.

Similar to other important scientific discoveries such as penicillin, the discovery that chickens can regenerate their own hearing occurred almost by accident. While studying how drugs known to cause hearing damage affect the tiny sensory cells in the ear, HHF-funded scientists needed to permanently damage a chicken's hair cells.

For 10 days, research assistants administered a common antibiotic known to cause hearing loss to laboratory chickens. On day 11 many of the hair cells were lost

and a few days later, even more were lost. Surprisingly, when the scientists looked three weeks later, almost all the hair cells had returned. They didn't believe these results so they did the experiment again and again. Sure enough, chickens can naturally regenerate their inner ear hair cells, restoring their hearing after damage. Now we know this ability is true of all vertebrate animals except mammals, including humans.

The concept of regenerating inner ear hair cells has already proven successful with mice. A recent discovery by one of our HRP scientists revealed that mice can be stimulated to regenerate hair cells and partially restore hearing.

A drug was used to block a certain auditory pathway that prevents hair cell regeneration in mammals. Once blocked, the supporting cells in the cochlea were free to transform into hair cells, partially restoring hearing. While much work remains, this proof of concept indicates that hair cell regeneration can be made to occur in mammals.

THE ROAD TO CLINICAL TRIALS

The HRP consortium of scientists has developed a strategic research plan to develop a cure for hearing loss and tinnitus in 10 years. This three-phase plan starts with

discovery research and culminates in clinical trials.

HRP scientists specifically developed the plan, and, importantly, periodically update it to incorporate new findings and approaches. The most recent revision occurred in November 2013 at our HRP meeting in Seattle. The strategic plan is a living document meant to guide but not limit the work, and relevance to the plan is one of the criteria for funding an HRP project.

Phase I: Years 1 to 5: Discovery Research: This phase will examine which genes, or which series of genes, trigger the natural regeneration of hair cells in animals such as birds and zebrafish. This phase will also examine which genes in mammals prevent the natural regeneration of hair cells. In addition, Phase I will determine the types of cells in mammals' ears that could serve as available targets for regeneration therapies.

Phase II: Years 3 to 8: Pathway Validation: Phase II begins with the residual cells that remain in a mammal's inner ear after hearing loss and uses the genes identified in Phase I to trigger hair cell regeneration.

Phase III: Years 8 to 10: Develop Therapies and Treatment Options: During this phase, the HRP consortium will partner with a pharmaceutical or other company to develop drugs that mimic the identified genes, resulting in a regenerative therapy.

THE POWER OF BIOINFORMATICS

In Phase I, HRP scientists will examine what genes or series of genes trigger regeneration in certain species and prevent it in others. But how will they compare the results? The answer is bioinformatics, sophisticated computational tools that have only been developed in the past few decades.

Bioinformatics provides a way to analyze and compare large data sets (there may be tens of thousands of potential genes that are identified) and will allow HRP scientists to mine this data to identify the right patterns and pathways for testing in Phase II.

A UNIQUE CONSORTIUM MODEL

For years, scientific research has been conducted in relative isolation—one researcher or one institution working alone to tackle a major health issue. HHF developed the HRP consortium model to eliminate the tunnel vision that comes from solo research. HRP scientists work on research projects together, share unpublished data and tools, and collaborate on the development and refinement of the HRP's strategic research plan.

“Progress toward a successful strategy for restoring hearing has been hampered by the scattershot approach

to the problem taken by individual investigators,” says HRP director Peter Barr-Gillespie, Ph.D., of Oregon Health & Science University.

“In the HRP, a consortium of outstanding scientists has chosen to work together collaboratively toward this common goal, an approach that should substantially shorten the time needed to devise a way to restore hearing in people with hearing loss.”

HRP consortium scientists meet twice a year in person, speak monthly by conference call, and communicate frequently by email. This continual dialogue helps eliminate repetitive work across the team, saving time and research dollars, and most importantly, accelerating the timetable to a cure.

In addition, HHF established a Scientific Advisory Board (SAB) to provide oversight and guidance to the HRP consortium. The SAB is comprised of senior scientists in hearing science, regenerative biology, and related fields. This board evaluates HRP consortium projects for funding and monitors the performance of funded projects against the goals of the projects. The SAB helps ensure that all donations receive the highest level of stewardship and that the research process is as effective and efficient as possible.

With your help, we can cure hearing loss and tinnitus in 10 years. Visit hhf.org/donate to help us accelerate the timeline toward a cure.

Shari Eberts is the chairman of the board of directors for Hearing Health Foundation. 



SUPPORT A CURE: HHF.ORG/DONATE

Watch Our New PSA

The promise of a cure for hearing loss and tinnitus is very real. And underlying that promise is the discovery that chickens have the ability to spontaneously restore their hearing by regenerating their damaged hair cells after suffering hearing loss. While humans and mammals do not naturally regenerate hair cells, the Hearing Restoration Project is aiming to enable just that. With sufficient funding, our researchers estimate clinical trials within 10 years.

Watch our new Public Service Announcement (PSA) that highlights these exciting developments on the road to a cure, at hhf.org/curing_hearing_loss.



Meet Les Paul

Ambassador

Saxophonist Chris Potter

Rock legend Les Paul was a performer, innovator, and rock legend. He also had a hearing loss and tinnitus. In 2013, the Les Paul Foundation and Hearing Health Foundation (HHF) teamed up to prevent and cure hearing loss and tinnitus, which affects 50 million Americans and 360 million people worldwide.

One of the most common causes of both is frequent exposure to loud sounds. As a result, many in the music industry are affected. Guitar great Les Paul, a man who meant so much to the world of music, was determined to find a cure for

hearing loss and tinnitus. Through his foundation's support of HHF's Hearing Restoration Project, an international research consortium of top hearing researchers, we have the opportunity to find a cure within a decade. Together, the Les Paul Foundation and HHF launched the Les Paul Ambassadors program to promote awareness of tinnitus and hearing loss; of the prevalence and warning signs of tinnitus and hearing loss; and of a cure possible through the Hearing Restoration Project.

Meet our second Les Paul Ambassador, the world-renowned saxophonist and composer Chris Potter. Potter, 43, lives in Brooklyn and travels around the world making music. He speaks about his experience with Ménière's disease, a hearing and balance disorder, here:

“I got Ménière's disease in my mid-20s. I've lost pretty much all my hearing in my left ear—there's just ringing. It was absolutely terrifying. I was getting episodes of dizziness, and my hearing would go up and down. In the meantime, I'd have to wake up at 5 a.m. and take three flights to get to a performance that night—when I didn't even know if I would be able to stand up. It was very stressful, as

was not knowing if it would happen in both ears, but I somehow made it through. It's something you get used to. But the vertigo alone is life-altering. You don't feel comfortable making plans.

It's surprisingly okay to be a musician who only hears out of one ear. It's been pretty much the same for 15 years now. My hearing went away, and the dizziness kind of stopped. I had a couple of surgeries that definitely did not help, and steroids didn't either. Some herbs and acupuncture helped, but it's hard to quantify the benefit that I got from Eastern medicine.

Since I'm a fairly well-known figure in the jazz community, I've gotten emails from at least nine or 10 musicians over the past few years who are suffering hearing issues of their own and are wondering if I have any advice. I hope I can help them find perspective and show them that I'm still here. But the sooner someone can find a way to fix this, it would really help some lives.

I have a very personal stake in this. Music is such a huge part of my life and a huge thing that gives meaning to my life, and to so many other people too. Being able to hear well is the tool you need to appreciate music, not to mention to be able to make it, too. It's very near to my heart.”

—Andrea Delbanco, Senior Editor



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Take Advantage of State Programs

By George Khal

Every consumer knows the average phone bill—be it for a landline or cell phone—includes surcharges, taxes, and fees. But for people with hearing loss the good news is that one such surcharge feeds the Universal Service Fund (USF). The fund defrays the cost of telecommunications equipment like amplified telephones or TTYs (teletypewriters).

The USF allows every state to discount phone service for low-income consumers through the Lifeline program as well as free video relay services for people who use sign language. It also funds access to telecommunications services in schools, classrooms, healthcare facilities, and libraries.

And in 47 states (Delaware, Michigan, and New York are the exceptions), the USF is used to reduce or eliminate the cost of assistive equipment for consumers.

To get details about the program in your state, visit the website for the Telecommunications Equipment Distribution Program Association at tedpa.org. Click on the Locate a

State Program link, and then click on your state link.

Each state administers its program differently, and each has different requirements. The only commonalities are that you must be a resident of that state and certified as having some degree of hearing loss. Certification can come from a hearing healthcare provider, a medical doctor, a rehabilitation counselor, or a qualified state agency.

Here is how some programs work:

- In many states multiple types of equipment are available: a telephone, telephone signaler/flasher, neck loop, or amplified answering machine.
- In California and Florida you can borrow equipment from various distribution centers; Colorado and Florida have demonstration centers throughout each state.
- In Colorado, Georgia, Kansas, Iowa, and New Jersey you must meet income eligibility requirements based on household size.
- In Hawaii you must have a 40 decibel hearing loss (moderate) or greater to qualify.
- In Iowa, Kansas, Texas, and

Wisconsin you receive vouchers in specific amounts, depending on the equipment you need, and then use the vouchers at approved vendors.

- In Iowa and Washington State you can apply for additional equipment—for example, a more powerful telephone or a ring flasher—as your hearing needs change over a set period of years.

- In New Jersey you can get free telecommunications equipment as well as loaner assistive listening devices such as personal FM systems.

- In Texas and Wisconsin, hearing, speech, vision, and mobility impairments are all covered.

If you live in a state that doesn't offer discounted assistive equipment through the USF, you may be eligible to receive financial help from your state's vocational rehabilitation services instead. Search online for your state name plus "commission for deaf and hard of hearing."

There are other financial resources you can explore as well. Contact local service clubs such as Sertoma, the Lions Club, and the Rotary Club in your state.

Of course, you can buy assistive equipment outside of state programs—such as online, at your hearing provider's office, and in stores in larger cities—but since you are already funding the USF, it's worth it to do a little research in order to benefit from it. 

George Khal founded Sound Clarity, an international retail company for assistive devices; he served as its president from 2000 to 2010. With a severe bilateral hearing loss, Khal was the Hearing Loss Association of America's chapter coordinator for Iowa and chaired its national convention in Cedar Rapids in 1992.



SUPPORT A CURE:
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Kori Linae Carothers is an adult-contemporary, instrumental musician who launched her fourth album, "Fire in the Rainstorm," on PledgeMusic, a website that allows fans to help fund and interact with musicians. Musicians can designate a nonprofit to receive a percentage of funds raised, once the initial goal has been reached, and Carothers selected Hearing Health Foundation. The drive runs through the end of May and the California resident's solo piano album is due out this summer.

dysphonia. But two days after my first Botox injection into both sides of my vocal chords—very painful—I felt a difference. My vocal chords don't feel tight, and I can talk fairly well.



I was born deaf in my left ear. We didn't know that until I was 5. So many tests, this doctor and that doctor exclaiming, "Oh, hey, did you see that? Come and look!"

My hearing loss did not deter me from listening to music. I would lay down right next to the record player and put my ear next to the speakers. Do I know what stereo sounds like? Not really. I only knew what sounded right to me; what really mattered was how the music made me feel.

I was very shy in school. People used to think that was a weakness, and I

was teased mercilessly in junior high and high school. Those were painful times in my life, and that is when I started writing music. I wrote so much on the piano. Then I learned about Windham Hill Records and the music by the label's founder, Will Ackerman, a composer and guitarist—who is now producing my album!

During the past few years, I have learned some incredibly painful lessons. This is what "Fire in the Rainstorm" is about: my story, the ups the downs. My voice and vocal chords were a mess because of spasmodic

Life can sure toss us monkey wrenches and wreck our plans if we let it. I won't let setbacks take me down and wreck my life. Instead, I will see them as a time for me to grow and feel hope that all things in my life will turn out just fine in spite of the negativity. I will turn the negatives into positives.

(Learn more at pledgemusic.com/projects/fireintherainstorm and at koritunes.com.)

What are fun, creative ways to fundraise for HHF? Find out at hhf.org/fundraise and help us cure hearing loss and tinnitus.



FUNDRAISE YOUR WAY

- Are you personally impacted by hearing loss?
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The Challenge of Hearing Well in Background Noise



By Courtney M. Campbell, Au.D.

Hearing speech in the presence of background noise is very difficult for people who have a hearing loss. This difficulty can occur regardless of age, degree of hearing loss, or which hearing aid is being used.

What is important to know is that hearing—and understanding—speech in the presence of background noise is a complex physiological process. Wearing a hearing aid can usually improve the way sounds are presented to the ear, but it cannot change the way your brain processes the signal your ear receives.

Auditory training can help improve the brain's ability to understand speech in noise, but keep in mind it requires a time commitment. (To learn more about auditory training, see Winter 2014's "Digging Deeper," at hearinghealthmag.com.)

The way hearing loss affects the way we hear, especially in noise, is more complicated than most people

realize. As you probably know from reading this magazine, hearing loss occurs when hair cells in our inner ears die or are damaged. The loss of these cells affects not only how loud a particular sound needs to be for you to hear it, but also how well you understand speech and how well you discern speech in the

presence of background noise. It is crucial that all three of these areas be tested during your audiological evaluation, and then discussed. The results of these evaluations are very important for both the hearing healthcare provider and the patient to know and understand.

For example, if I have a patient with a moderate hearing loss but poor word-recognition ability and a severe difficulty understanding speech in the presence of background noise, it is my responsibility to discuss these results in detail with the patient in order to set up realistic expectations about their hearing aid usage.

This is because this patient—even with the best hearing aids on the market—will probably still struggle in very noisy situations.

When a very severe deficit for hearing in noise is present, there are some supplemental devices that

can help enhance what is called the signal-to-noise ratio. The signal-to-noise ratio is the amount of difference between the signal (speech) and the noise. As a general rule, most people hear and understand speech better the larger the difference between the signal and the noise.

Assistive listening devices such as frequency modulation (FM) systems and remote microphones can be used in addition to hearing aids to maximize the signal-to-noise ratio. These devices are usually worn by the speaker or passed between speakers, sending their voice(s) directly into the hearing aids. This allows for a louder, clearer signal for the listener. For a patient like the one described before, I would suggest that they consider an assistive listening device to use in very noisy places.

If you are continuing to struggle to hear in environments with a lot of background noise, even while using hearing aids, make sure that your hearing healthcare provider conducts a thorough hearing exam that includes word-recognition testing as well as speech-in-noise testing.

Once these test results are explained to you, you'll understand better about how your ears are processing sound even with the use of hearing aids, and your expectations will be more realistic. And don't forget to ask your hearing professional about assistive listening devices. 

An audiologist at A&A Hearing Group in Chevy Chase, Md., Courtney M. Campbell, Au.D., received her undergraduate and doctorate degrees from the University at Buffalo in New York. She has a hearing loss and has been wearing hearing aids for over a decade.



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A hearing aid cannot change the way your brain processes the signal your ear receives.

can help enhance what is called the signal-to-noise ratio. The signal-to-noise ratio is the amount of difference between the signal (speech) and the noise. As a general rule, most people hear and understand speech better the larger the difference between the signal and the noise.

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Hearing Health Foundation aims to educate Americans about safe listening levels and how to prevent noise-induced hearing loss. Nearly 50 million Americans, including 1 in 5 teenagers, suffer from hearing loss.



How Loud Is Too Loud?

Sound level is measured in decibels (dB). As the number of decibels increases, so does the risk of harm to hearing, as shown in the guide below.

140-165 Firecracker, shotgun firing



140 Jet taking off



120 Ambulance siren, thunderclap

110 Jackhammer, rock concert, symphony orchestra

Regular exposure of more than 1 minute at or above 110 decibels risks permanent hearing loss.



105 MP3 players at maximum volume

No more than 15 minutes of unprotected exposure at or above 100 decibels is recommended.



95 Subway platform



85 Heavy city traffic, school cafeteria

Prolonged exposure to any noise at or above 85 decibels can cause gradual hearing loss.



75 Dishwasher

70 Hair dryer, vacuum

60 Normal conversation

40 Refrigerator

30 Whisper

0 Smallest sound a person with normal hearing can detect.

NAME:

Alan Kan

University of Wisconsin–Madison

BIO:

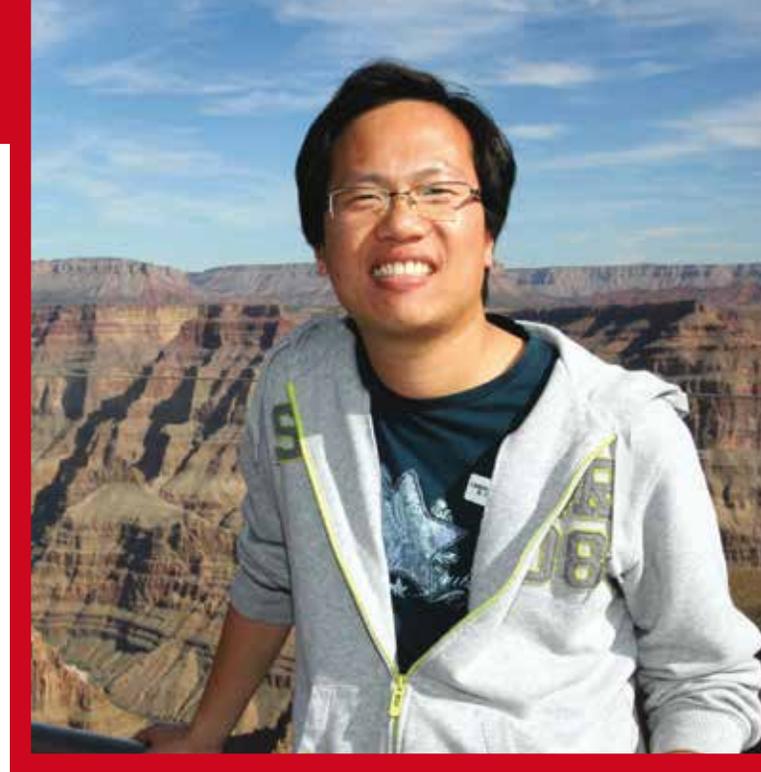
Kan is a research associate in the Binaural Hearing & Speech Lab at the University of Wisconsin–Madison. He received his Ph.D. in engineering from the University of Sydney, Australia, where he also worked in audio technology. Kan is a 2013 Hearing Health Foundation (HHF) grant recipient and a Royal Arch Masons award recipient.

IN HIS WORDS:

Applying innovative engineering to close the gap in performance between people with hearing impairment and people with normal hearing is the focus of my research. In particular, my current work is aimed at understanding the nuances associated with bilateral cochlear implantation and both the possibilities and challenges we face in improving hearing. I have been studying the effects on hearing from having differences in the two ears, whether it be from differences in the physical placement of the implant in the two cochleae to more physiological differences that arise through hearing loss.

These differences between the ears, while challenging at present to overcome, also point to a “better ear” for speech understanding. I am hoping to take advantage of this better ear to significantly improve hearing speech in noisy environments by combining it with innovative engineering. This technology can potentially be used with those with central auditory processing disorders (CAPD).

Cochlear implant research is the field I started



working in, about three and a half years ago. My hope is that the technology that I develop will benefit people with a wide variety of hearing impairments.

I was born in Hong Kong, but I’ve spent most of my life in Australia. I’ve been trying to travel around the U.S. while I am here. Last November I went to the Grand Canyon with my cousin. I had a great time seeing and photographing the scenery at the canyon as well as taking in the lights and sounds of Vegas. The photo [above] is of me standing on the Skywalk, the glass walkway that extends out over the Grand Canyon. Very cool!

As a kid I loved logic puzzles and computers, so studying engineering was natural. I have always been interested in problem solving, ever since I was young. In grad school, my adviser introduced me to the world of audio engineering research. I have been interested ever since.

To be a good scientist/engineer, one who will be able to translate the answers we obtain from scientific experiments and apply them to real-world problems—that’s my dream.

—Andrea Delbanco, Senior Editor

We need your help to continue funding excellent hearing researchers like **Alan Kan, Ph.D.** To donate today to Hearing Health Foundation and support groundbreaking research, visit hhf.org/donate.



Hearing Health Foundation is grateful for the support of the Royal Arch Masons, who support Emerging Research Grantees working in the area of central auditory processing disorders (CAPD). We appreciate the support of the Royal Arch Masons for their dedication to healthy hearing and commitment to funding CAPD research.



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