



Soundings Newsletter

Sudden Hearing Loss

A medical emergency

Earlier this year, the American Hearing Research Foundation (AHRF) created a 5-minute video, “Spotlight on Sudden Hearing Loss,” to share with the public via the Public Broadcasting System (PBS). PBS is airing the video across its nationwide network, with a major airing push concentrated during the summer of 2023.

Sudden hearing loss (also called sudden sensorineural hearing loss (SSHL) or sudden deafness) can be extremely frightening and is a medical condition that requires prompt medical attention. Michael E. Hoffer, MD, University of Miami and member of the AHRF Board of Directors explains, “Suddenly the world goes quiet in one ear. You wake up with it or you’re doing some activity and all of a sudden...nothing in one ear.”

This type of hearing loss comes on all at once, over a few hours, or over a several days. Often, it affects only one ear, but it can involve both. A person affected by SSHL also may notice a feeling of ear fullness, dizziness, or ringing in the ears.

“It’s important to see your doctor as soon as possible,” notes Dr. Hoffer. “Most of the treatments we offer are



Michael E. Hoffer, MD

much more effective if administered early, rather than later.”

The estimated incidence of SSHL ranges from 11 to 77 per 100,000 people per year. For most people (90 percent, according to the National Institute on Deafness and Other Communication Disorders), the exact cause is never identified. SSHL may be related to infections, head trauma, autoimmune diseases, or other conditions. At present there is no medical advice for how to avoid SSHL.

AUTUMN IS CALLING: JOIN OUR BOLD AND AUDACIOUS GOAL



At the American Hearing Research Foundation (AHRF), we believe in a world where people thrive by preventing hearing loss and treating balance disorders. Therefore, we are devoted to understanding these life-altering conditions and enabling discoveries that can contribute to people’s quality of life and their ability to meet the challenges of day-to-day living.

As we begin to notice the leaves changing color, this Fall Season we also turn our attention to our fundraising efforts. This year, we have an audacious goal to raise \$100,000 by the end of the year. While we are mesmerized by seeing the most dramatic colors of Fall unfolding this month, we hope that our purpose deeply captivates and touches your heart and unlocks your generosity this season. *Continued on p. 2.*



Autumn is Calling: You can be part of something BIG

(Continued from page 1)

From birth to adulthood, our ears are a powerful and fragile tool. Sadly, hearing loss is a significant public health issue. According to the World Health Organization, by 2050, nearly 2.5 billion people will have some degree of hearing loss, and at least 700 million will require hearing rehabilitation. Hence our commitment to alleviating the developing hearing health crisis through groundbreaking research and education.

But we can't do it alone. With just about \$25,000 raised thus far, now more than ever, we rely on contributions from individuals like you. Your donation of any size can make a significant difference in the health and well-being of those physically, emotionally, and mentally affected by hearing and balance disorders.

Every dollar you donate toward our \$100,000 goal this year will allow AHRF to:

- Gain greater knowledge and find long-term solutions and treatments for people affected by hearing and balance disorders.

- Encourage the next generation of researchers.
- Educate people on how to prevent and identify hearing loss, and preserve hearing.

Your donation is an investment in life-changing research and education impacting the hearing health of communities. Thank you for making AHRF your "charity of choice."



DONATE ONLINE AT

American-Hearing.org

OR SEND YOUR CHECK TO:

American Hearing
Research Foundation
154 W. Park Avenue #586
Elmhurst, IL 60126

WE'VE MOVED! Note our new address.



HEARING AIDS IN THE NEWS

Hearing Aids and Insurance

In August 2023, the Illinois legislature passed a law that requires insurance providers to cover hearing aids and related services for people of all ages. The new law, which takes effect January 1, 2025, requires insurers to provide coverage for everyone if their doctor prescribes a hearing instrument.

The American Speech-Language-Hearing Association notes five states (Arkansas, Connecticut, Illinois, New Hampshire, and Rhode Island) require coverage for both children and adults. Another 19 states require health benefit plans in their state to pay for hearing aids for children. Coverage requirements – such as ages covered, amount of coverage, and provider qualifications – vary by state. You can read more at <https://www.asha.org/advocacy/state/state-insurance-mandates-for-hearing-aids/>.

Traditional vs. OTC Hearing Aids

With hearing aid purchases, cost is just one important thing to consider. In an April 20, 2023, online article, Consumer Reports suggests that if you're thinking about purchasing hearing aids, you'll want to:

- Rule out non-hearing-aid related problems,
- Get your hearing tested, and
- Consider how comfortable you are with managing the selection and setup of hearing aids on your own.

With over-the-counter hearing aids, you'll want to know:

- How much you can customize the device,
- Whether you prefer an over-the-ear or in-the-ear style,
- How good is customer service, and
- What the return policy is.



“Last weekend - for the first time - I said, ‘wait, I need my hearing aids.’ I realized I could hear the conversation better by wearing them. It took two years of wearing them and adjusting the settings and training my brain.”
– *Hearing aid user Lois Hodgson (pictured, right)*

Hearing Aids and Dementia

A recent study suggests hearing aids significantly reduce the risk for cognitive decline and dementia, and even improve short-term cognitive function in individuals with hearing loss. The use of hearing restorative devices was associated with a 19% reduction in cognitive decline. The data suggest that the protective benefits accrue over time and that even those with some dementia when they begin wearing hearing aids see improvement.

The large meta-analysis conducted by researchers at the National University of Singapore pooled data from 31 smaller studies. Findings were published online on December 5, 2022, in *JAMA Neurology*.

SPOTLIGHT ON
Lendra Friesen, PhD
Assistant Professor
University of Connecticut

**Recipient of AHRF's
Georgia Birtman Grant**

Born and raised in Canada, Lendra Friesen's career in hearing and cochlear implant research has taken her across the continent – spending time in Utah, L.A., Seattle, and Toronto. Now she heads up the Cochlear Implant Brain and Behavior Lab at the University of Connecticut – which she founded in 2014. Along the way, Dr. Friesen has developed expertise in audiology, hearing science, and neuroscience.

Dr. Friesen's current research combines electrophysiology (the study of the electrical properties of biological cells and tissues) and behavioral methods to understand where problems occur in the auditory system.

Hearing changes as we age

Dr. Friesen explained, "There definitely are changes in hearing as we age that have to do with timing. The speaking rate, for instance. We know if a speaker slows down, the listener can understand them better."

In a recent study in Dr. Friesen's lab, participants were asked whether a sentence was said with anger, sadness, happiness, anxiousness, or no emotion. Dr. Friesen noted, "It was surprising what a difference there was with aging. [Younger,] normal-hearing individuals scored about 85-95%. For elderly participants, the score was much lower – about 65%. For an elderly person to pick up on emotion, or humor or sarcasm, the voice frequencies and intensities must be exaggerated."



Pinpointing the problem

One of the challenges with hearing loss is determining where the problem exists. Is it in the mechanics of the ear? Or somewhere in the neural pathways of the brain?

In 2023, Dr. Friesen and her colleague Robert Morse, PhD, received AHRF's prestigious Birtman Grant, which offers funding up to \$75,000 and is awarded for exceptional scientific investigation.

They are using the funds to develop a novel way to calculate the amount of information traversing the brain in response to a sound stimulus. Working with the same participants, they first will conduct behavior-related tests addressing speech comprehension and emotion recognition. Then they will measure participants' auditory electrophysiological responses at the brainstem midbrain, and at the brain's auditory cortex level. Dr. Friesen believes this approach will yield "more robust data, and a much-needed measure of fidelity" resulting in a richer understanding of an individual's auditory pathway.

What will data relationships tell us?

Dr. Friesen is eager to see if there are relationships between tests. "If a person has poor behavioral results, does that predict the same result in the neurologic data? Is that reflected at both the midbrain and the cortical levels? Maybe the results are good at one level but not at the other. This could help us design different treatment approaches."

When asked what comes next, Dr. Friesen noted, "We're studying young vs. older. What happens if we look at people who have hearing loss resulting from meningitis? Or a progressive versus sudden hearing loss? This approach could have a significant impact on how we treat patients."



SPOTLIGHT ON
Parveen Bazard, PhD
 University of South Florida

**Recipient of AHRF's
 Richard G. Muench Chairman's Grant**

Hearing research involves many disciplines, such as genetics, biochemistry, and audiology. Parveen Bazard entered the field through nano-science and laser technology.

After Parveen Bazard received his master's degree in chemical engineering, he looked for an opportunity to contribute to health care applications. The answer came when he was recruited to work on a project with Robert Frisina, a well-known hearing scientist at the University of South Florida. Bazard explains, "They were looking for a person with a background in nano-science and laser technology who they could train in hearing science."

He added, "My PhD work focused on trying to use those lasers and those nano particles for next-generation cochlear implants. After that, I expanded specifically into the hearing field."

Age-related hearing loss has been a recent emphasis. "It has far-reaching implications in people's health, that goes beyond hearing," Bazard noted. "For instance, once you lose communication in your life, you start living in isolation. There is an economic burden, because you lose productivity." And age-related hearing loss potentially "will affect 500 million people world-wide by 2030."

Bazard's current project is an extension of his work with **anti-inflammatory hormone therapies**. He explained, "Whether inflammation causes aging, or aging causes



inflammation hasn't been determined. But inflammation is certainly linked with aging." He noted, "We had some partial successes, but there were challenges in taking the therapies to market. For this project, I was specifically looking for some compounds that wouldn't face difficulties going from lab to clinic."

In January 2023, AHRF awarded Bazard its prestigious Richard G. Muench Chairman's Grant. With the help of co-investigators Robert Frisina, PhD, and Bo Ding, PhD, Bazard is using the funding to investigate **L-ergothioneine (EGT)**, a naturally-occurring amino acid that has both antioxidant and anti-inflammatory properties and which has been found to be beneficial in other diseases. This compound is available over the counter and can be taken orally. Bazard noted this compound "is only taken through dietary supplements. A top source is mushrooms, especially oyster mushrooms." There are no known side effects related to taking EGT.

His study is investigating **EGT's effect on the aging auditory system**. By administering EGT to aging mice in conjunction with exercise, he and his team are working to understand the underlying biological mechanisms, and ideally will find a minimum dose that can provide hearing protection in mice. "One thing that's emerging from this work is that we need to target more than one mechanism to ease hearing loss. My hypothesis is that if we start mixing this therapeutic compound with non-chemical therapies, it will allow us to reduce its dose. For instance, if we combine this therapy with exercise, we might see the same impact with a lower dose."

Bazard hopes to see this study expand to more animal models and then proceed to clinical trials. Eventually he would like to turn his attention to cochlear implants, new diagnostic tools, and imaging techniques.



SPOTLIGHT ON
Anoop Basavanahalli
Jagadeesh, PhD
Postdoctoral Fellow
Northwestern University

Recipient of AHRF's Discovery Grant

“Music perception involves your auditory system, neural system, emotions, attention, even body movement. They work together to allow you to make sense of and enjoy music. Taking out one or two of them significantly affects your engagement with it.”

Anoop Basavanahalli Jagadeesh (“Dr. Anoop”) can pinpoint the moment his career in audiology began.

“I was hooked on June 22, 2005 - the second day of my undergraduate program. The person who eventually became my PhD supervisor was giving us a tour of the campus and took us to the audiology clinic. I saw how a child who had hearing loss could not speak because he could not hear. That decided it for me.”

Now his work as a postdoctoral fellow at Northwestern University is related to auditory perception, hearing loss, and aging. In January 2023, he received an AHRF Discovery Grant to explore how individuals with hearing loss perceive music. Dr. Anoop notes, “Music is a deeply emotional and meaningful sound. However, most of the focus in hearing research has been on speech perception. Music is a second or third priority.”

It’s apparent that people engage with and enjoy music less when they have a hearing loss. To better understand why, Dr. Anoop said, “We’re taking multiple approaches. One is a psychoacoustic approach, tracking hearing thresholds, and speech in noise perception. Next – this is the focus of our AHRF-funded study – we’ll record frequency following responses (FFRs)” [Note: FFR is a measure of sustained brain activity in response to sound.]

“We want to see how the brain picks out different features of music. Music gives you rich sound stimulus that has so many acoustic parameters: pitch, loudness, timing, timbre. Each can be picked out through FFR testing.” He and his team will look for brain response differences (via the FFRs) that correspond to participant engagement with music.



He explains further, “What we are looking at specifically is how sensorineural hearing loss (primarily of cochlear origin) affects music with different pitches.” Harmonics are of special interest - because “harmonics determine how much richness you perceive from sound.” Dr. Anoop continued, “We know someone with hearing loss generally will have trouble with higher frequencies. These frequencies are the ones that lose that harmonic information. We’re asking whether this loss of harmonics relates to their enjoyment with music.”

Using a “Brain Keyboard”

One of the innovative aspects of Dr. Anoop’s work is the use of a 36-key “brain keyboard.” A simple strand of music is played on the keyboard, recorded, then the study participants hear the same recording. Each person’s brain responses to the music are tracked, and then can be converted back into sound that’s played on the keyboard. “You can literally convert the brain’s response back into sound.”

In this study, the brain keyboard is being used as a quantitative tool, where “multiple people rate the same sound conversion, and their ratings are compared to their ‘enjoyment of music’ responses.”

Next: Hearing Aid Applications

Dr. Anoop explained, “We’re working on a study that explores whether hearing aids themselves distort sound before it goes into the ear. Do hearing aids distort a person’s music perception? Perhaps the brain keyboard could be used to fine-tune hearing aids so that listening to music can be more enjoyable.”

AHRF and Meniere's Disease Initiatives

With backing from directed donations, one of AHRF's special interests is Meniere's disease research. Meniere's is called a disease, but it really is a cluster of symptoms for which the underlying cause is unknown and for which there currently is no cure.

Meniere's tends to be known for periods of extreme and unpredictable dizziness. Other common symptoms include tinnitus, muffled hearing or the sensation that one's hearing has been blocked, and a feeling of congestion, fullness, or pressure in the affected ear.

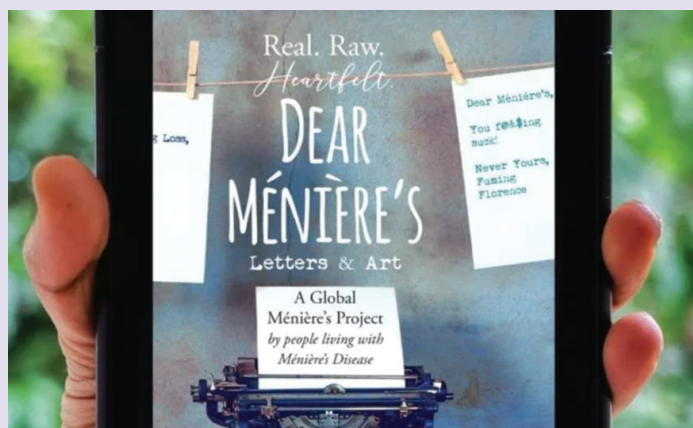
A Global Meniere's Project

With over 200 entries, *Dear Meniere's Letters & Art* provides a deeply personal look at what it's like to live with Meniere's disease. Heather Davies, Steve Schwier, Anne Elias, and Julieann Wallace collaborated across continents, inviting individuals who suffer with Meniere's to "write to their disease." The result – including artwork – is just what the covers says: "Real. Raw. Heartfelt." Book proceeds will fund Meniere's disease research; the American Hearing Research Foundation is one of the recipients for this purpose and has received nearly \$1,000 so far.

Steve Schwier contributed essays and artwork to the book and was instrumental in naming AHRF as one of the project's charities. Steve notes, "I had no idea how much working on this project would change me. Living with Meniere's disease is a very isolating existence. Letters and artwork started flooding in from around the globe. To be truthful, it was overwhelming. This project gave me a chance to be heard, and gave so many silent sufferers a voice like we've never had before. It's a collection of hearts on sleeves. Although we are an invisible community, we will no longer be ignored."

AHRF-Funded Studies

Since 2017, AHRF has funded four studies related to Meniere's disease. Results from one study that explored the genetics of familial Meniere's disease were recently published. (More about this in our next issue!) Another explored an experimental treatment and has proceeded to the next level of clinical study. One examined the molecular/cellular cause of the disease by looking at single cell RNA sequencing of cells from inner ear tissue, and another explored different cell functions related to Meniere's.



I no longer feel alone, having been touched by so many precious souls and reading their stories and seeing their art.

"I chose AHRF to receive funds from this project because I believe in the research projects they are doing to help people like me. The support I have received from them has been unparalleled in my personal endeavors, and I believe they are giving us the best chance to further research in this fight against Meniere's disease."



Golf Outing Raises \$10,600 for Meniere's

The grassroots initiative *run because* led by Katie Mertz continues to pursue its goal to raise awareness and funds for AHRF-funded Meniere's disease research. In August, Rich and Kim Mayer (pictured) and their daughter Katie hosted the 5th annual *run because* golf outing at Songbird Hills Golf Club. It was a beautiful day for golf, and the event raised \$10,600 for Meniere's research.

October: National Protect Your Hearing Month

During this year's National Protect Your Hearing Month – observed each October – you can learn how to protect yourself and your loved ones from noise-induced hearing loss.

When you can't turn down the volume or move far enough away from loud sounds, you can use hearing protectors to keep your hearing healthy. The best kind of hearing protectors are the ones you like and will use.



Two types of hearing protection devices—earplugs or protective earmuffs—can help prevent hearing damage. Hearing protectors limit the level of sound. They do not block out all noise. Earplugs fit directly into the ear canal, the narrow passageway between the outer ear and the middle ear. They come in disposable and reusable options and in various sizes.

Protective earmuffs are easy-to-use, reusable, plastic cups that reduce noise by completely covering both ears. They

come in sizes that fit most people, including infants and children. Earmuffs are easier than earplugs to wear correctly, especially for young children.

Why Hearing Protection Matters

Protecting and treating hearing loss may help with more than just your hearing. Hearing loss has been connected to a number of other health conditions, including depression, diabetes, chronic kidney disease, and increased hospitalizations.

A July 2020 study published by the *Lancet Commission on Dementia Prevention, Intervention and Care* cited 11 risk factors for dementia including hearing impairment in mid-life. The report also stated that dementia typically starts many years before it is recognized. Untreated hearing loss can impact the brain and cognitive health. *Source: [https://doi.org/10.1016/S0140-6736\(20\)30367-6](https://doi.org/10.1016/S0140-6736(20)30367-6)*

There is also a link between untreated hearing loss and falls. According to a 2012 study conducted by Johns Hopkins University School of Medicine, an increase in hearing loss in an individual, for instance going from normal hearing to an untreated mild hearing loss, is associated with a 3-fold increase in fall risk. *Source: [Arch Intern Med. 2012;172\(4\):369-371. doi:10.1001/archinternmed.2011.728](https://doi.org/10.1001/archinternmed.2011.728)*

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- Chairman's Circle \$5,000 and above
- Research Supporter \$100 to \$999
- Research Champion \$1,000 to \$4,999
- Friends of the Foundation \$99 or under

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