Annual Giving Campaign

The Annual Giving Campaign sustains the current research and educational programs that are vital to increased knowledge about hearing and balance related disorders. The Foundation welcomes contributions of all levels and from all individuals, organizations, and corporations. Gifts to the Annual Giving Campaign will be recognized in our publications and on the website. There are many ways to support the Foundation this year, and in years to come.

Giving to the General Fund

Contributions to the AHRF's Annual Giving Campaign support the Foundation's general fund which underwrites research grants and special projects. General funds sustain the core programs that are central to the Foundation's mission. Donations to the Annual Giving Campaign can also be restricted to use for research into certain areas such as Meniere's disease. Gifts are accepted on-line at the Foundation's website and by mail or fax. There are several levels from which to choose:

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

Honor and Memorial Gifts

The Foundation acknowledges gifts made in honor or in memory of the special people in our lives. We recognize these special tributes personally, and appreciate the kindness of many generous individuals. Please use the enclosed form to provide us with your instructions about notifications.

Planned Giving

The Foundation wishes to secure its role in research for generations to come. When you remember the Foundation through a gift in your will, known as a bequest, you become part of a special group of supporters whose generosity has made possible some of the most innovative and cutting-edge research projects. Gifts that come from sources other than current expendable income are usually part of an overall estate plan that may take effected during a donor's life or after their death. Individuals can choose to leave a specified sum of money or a percentage of their estate. Other forms of planned giving include securities, bank accounts and certificates of deposit, life insurance policies, retirement plans, life income funds, and other similar giving mechanisms. These types of gifts should be arranged by a qualified attorney or financial planner.

The Combined Federal Campaign

The American Hearing Research Foundation is a designated charity for the Combined Federal Campaign (CFC). The Foundation receives convenient contributions made through payroll deductions for employers that participate in the CFC. The Foundation is listed on the CFC National List under National/International Organizations, number 10571.

Research Committee Member Wins Prestigious Fulbright Scholarship

The Foundation congratulates Dr. Anna Lysakowski on her Fulbright Visiting Scholarship at the Glasgow School of Art. Dr. Anna Lysakowski was born in Chicago and has travelled extensively as a vestibular neuroscientist, having visited over 20 countries so far. She earned bachelors degrees at Loyola and at University of Chicago and a Ph.D. at University of Illinois at Chicago, and was a postdoctoral fellow at University of Chicago. She is now a Professor of Anatomy and Cell Biology and has been on the faculty at UIC since 1993. Dr. Lysakowski's career highlights include an experiment on a NASA Space Shuttle, helping discover a gene for inner ear hair cells (published in Science), and characterizing a cytoskeletal organelle in the same cells with electron microscope tomography (EM tomography). She has published over 40 peer-reviewed papers and book chapters and has been continuously funded by the National Institutes of Health since 1993. As a Fulbright Visiting Scholar, she is working with colleagues at the Digital Design Studio of the Glasgow School of Art on 3D-reconstructions of biomedical images and her own EM tomography data. The Foundation congratulates Dr. Lysakowski on this prestigious award.

Support Our *"Run Because"* National Partnership

The Foundation actively supports the Run Because running team at half marathons held in various locations around the United States. All funds raised by the team during these events are earmarked specifically for scientific research into Meniere's disease through the American Hearing Research Foundation. Fundraising beer runs and walks will be taking place in the summer of 2015. If you are in the area, please show your support. Check their website for updates at: http://runbecause51x50.wix.com/run-because.

- February 15, 2015 – Austin Half Marathon, Austin, TX
- May 24, 2015 – Run to Remember, Boston, MA
- June 13, 2015 – Seattle Rock n' Roll Half Marathon, Seattle, WA
- September 20, 2015 – Navy/Air Force Half Marathon, Washington, DC
- September 27, 2015 – Chicago Half Marathon, Chicago, IL
- October 31, 2015 – Jazz Half Marathon, New Orleans, LA

"I run because I can. When I get tired, I remember those who cannot run, what they would give to have this simple gift I take for granted, and I run harder for them. I know they would do the same for me." - Anonymous

Shopping with Amazon Smile®

If you enjoy shopping with on-line retailer Amazon, you can also provide financial benefits by choosing the American Hearing Research Foundation from their list of recognized charities. Tens of millions of products purchased through Amazon Smile ® are eligible for this giving program. You can use an existing Amazon account and all of the account settings will be the same. The difference is that a portion of the purchase price will be directed to the American Hearing Research Foundation when it is chosen as your designated charity. Periodically, Amazon will offer limited time promotions that increase the donation amount. Certain restrictions apply. The donations made through this program are not tax deductible because the donation is being made by Amazon.

What is a Cochlear Implant, and who is a Candidate for Implantation?

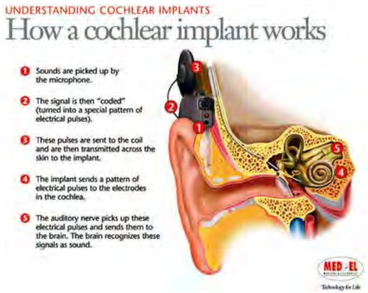
In our last newsletter, we discussed how hearing aids work. However, implantable hearing systems are a consideration when conventional amplification is sub-optimal or contraindicated. For those with severe to profound inner ear hearing loss and sufficiently compromised speech discrimination ability, cochlear implants offer access to acoustic information via electrical stimulation of the hearing nerve.

A cochlear implant system is a prosthetic device that transduces acoustical into electrical sound and delivers this electrical stimulation to the hearing nerve directly. It is most often recommended for severe and profound hearing losses that are sensorineural in nature and when speech discrimination is poor for both ears. Cochlear implant candidates receive little or no benefit from traditional hearing aids. These implants are infrequently indicated for those with auditory neuropathy and can be recommended for some cases of congenital ear malformation where the hearing nerve has developed sufficiently.

Research on cochlear implants began in the 1950s, and the first implantation was completed at the House Ear Institute in 1961. Over the following decades various individuals and groups advanced cochlear implant research. Devices became commercially available in the mid-1980s. Today, there is a wealth of focused research devoted to device advancement and improving clinical outcomes.

So how does a Cochlear Implant Work?

Cochlear implants are comprised of internal and external parts. An internal electrode is most often inserted into the cochlea via the round window or via cochleostomy. For cases of cochlear ossification or malformation, the electrode may be inserted into the internal auditory canal. The electrode is connected to an internal magnetic receiver which is placed in a skin-covered trench surgically created in the mastoid bone. A magnetic connection traverses the skin linking the external processor to the internal receiver, and the external system is affixed to the head via the magnetic connection.



When electrical sound is transmitted, it flows from the external sound processor across the skin boundary to the internal receiver and then to the cochlear electrode array. In this way, the hearing nerve can be stimulated by a direct means, even when there is extensive damage to the delicate sensory cells of the cochlea.

Generally, there are two ways in which cochlear implants process and deliver sound: 1) stimuli are delivered with a place/pitch relationship, and 2) stimuli are delivered with a time/pitch relationship. The first processing strategy is governed by the place theory of the cochlea, which says that higher frequencies will be encoded at the base of the cochlea and lower frequencies will be encoded at the apex. Each successively deeper cochlear electrode corresponds to a lower pitch sound. Thus, higher pitch information is delivered to basal electrodes and lower pitch information is delivered to more apical electrodes. Because a cochlear implant is inserted at the basal end of the cochlea, it is likely that higher frequency information will be more effectively delivered. This can account for some of the high pitch or tinny reports of implantees, but can also contribute to intelligibility of high frequency speech information.

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The second mechanism is designed to deliver stimulation in timed pulses which correspond to the frequency of sound. The temporal theory of sound processing says that acoustical pitch information is conveyed according to the frequency of stimulation, and the site of stimulation is independent of the perceived pitch.

Both the temporal and place theories are needed to explain human auditory perception, and modern cochlear implants are engineered to function according to both principles. An audiologist will determine which strategies are most appropriate for an individual. This is usually determined by comparing performance with variable stimulation rate and electrode activation. Changes in stimulation rate and site of stimulation are made in order to maximize speech intelligibility, but also based on patient perceived preferences.

What Factors Affect Implantation Outcomes?

A number of different factors determine the success of a cochlear implant. Studies have shown that duration of deafness is a good predictor of success. Younger implantees perform better than elders who have been implanted for the same length of time . Also, those who were postlingually deafened, who possess auditory memory, tend to be more successful than those who were prelingually deafened.

Anatomical and structural variables can affect the outcome of implantation. Those with a greater number of intact spiral ganglion cells typically have better outcomes. The depth of electrode insertion can be predictor of success, as can the signal processing strategies employed in the device.

And, of course, the personal support system of the patient is crucial to a positive outcome. Communication with healthcare professionals, family, and friends is critical to ensuring optimal device performance, to enhance learning, and to maximize the listening experience.

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AMERICAN HEARING RESEARCH FOUNDATION SOUNDINGS NEWSLETTER

Running the Distance in 2015

To our many supporters, we are known as the premier nonprofit charitable organization dedicated to funding important research on hearing loss and balance disorders. To scientific researchers, we are known as the organization that welcomes innovation while providing rigorous scientific review of groundbreaking proposals. To patients, we are known as a compassionate and trusted source of information when trying to manage debilitating disorders. To so many people, we are the organization whose efforts will one day lead to better cures and treatments for people afflicted with hearing-related problems. But our work would not be possible without the generous and enduring support of the many individuals and organizations that share our goals.

As we approach our sixtieth year, the American Hearing Research Foundation takes pride in its role as the leading non-profit organization dedicated to funding research on hearing loss and balance disorders related to the inner ear, and to educating the public about these disorders. The Foundation was founded in 1956 by Chicago otolaryngologist Dr. George E. Shambaugh, Jr. (1903-1999), and has been funding research into hearing loss, and its causes and cures. The Foundation funds eight to ten projects a year and has funded more than $1 million in research grants.

Long before it became an official Foundation, the American Hearing Research Foundation has strong grounding in research. We trace our roots back to the first operation performed to restore hearing. In 1938, our founder took part in developing and performing the first successful surgical technique to restore hearing. Dr. Shambaugh performed the first fenestration operation together with Dr. Julius Lempert (1890-1968). Fenestration was a surgical procedure that restored hearing to patients with otosclerosis, a condition where spongy bone grows in the middle ear later preventing the vibration of small bones (stapes) that are crucial for hearing. Fenestration has now been replaced by procedures that remove the damaged stapes bone and implant an artificial one – another class of procedures called stapedectomies that researchers associated with the Foundation have developed.

In 1940, a grant from the Chicago Community Trust was used to construct and equip a laboratory at Wesley Memorial Hospital, located in Chicago, to perfect the fenestration technique. In the 1940s, grants from the John and Mary R. Markle Foundation of New York and gifts from grateful patients of Dr. Shambaugh and Dr. Eugene Derlacki, the Foundation's co-founder, helped to construct and equip a hearing clinic at Northwestern University Medical School, the first of its kind where numerous diagnostic procedures were developed.

Since then, numerous donors have made generous contributions to the Foundation to provide critical funds for researchers investigating how we hear, why hearing is lost, and how it can be restored. Project funding goes towards purchasing lab equipment, hiring staff and lab technicians, procuring lab supplies and imaging equipment, and more – without which this research would be impossible. With federal funding tighter than ever, the Foundation provides a much needed source of funds for research that leads to innovative treatments and possible cures for hearing and balance related disorders. Research findings have provided new insight into hearing loss and have helped to illuminate promising pathways to hearing restoration in the future. Won't you please support the Foundation as it engages with researchers through the grant programs, with patients and health care providers, and with all whose lives will be improved because of your donation.