



The Ear Drum

Virginia Lions Hearing Foundation & Research Center, Inc.
Box 800477 UVA Health System
Charlottesville, VA 22908-0477
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2011

Message from the President

Dear Fellow Lions,

Spring is a time for new beginnings, a fresh start. So *spring* into action with that new idea you have on a great fund-raising activity where your proceeds will go into Virginia Lions Hearing Foundation.

Discover the sound of birds singing, bees buzzing, children laughing and someone saying for the first time "I love you." Can you imagine not hearing music or the first words of your child or grandchild.

What is life without being able to hear? As we get older, our hearing is not what it used to be. We find it difficult to understand those around us. What if we couldn't hear someone crying for help? What if in a split second there is something or someone that we need to hear to keep from missing out on something special? What if we could not hear at all? STOP, we can make a difference through research or surgery.

With the funds you, your club, and your District contribute, you make such a difference that you can't imagine. Your contributions mean so much more to so many others. Please gather and give with your heart.

May this year be your best fund raising year ever. Remember it's for others that we serve as Lions.

Thank you.

Yours in Service,

Jessie

Lion Jessie Garrett, PDG
President, VLHF

Executive Director's Message

Our current Lions year is galloping toward its symbolic finish line. Lions throughout Virginia are working to assist the many people and groups who need our help. We are living our motto, "We Serve."

The members of the Hearing Foundation's medical staff also work steadily to serve people with hearing-related problems through patient care and both basic and applied research projects.

More than 95% of the contributions which the Virginia Lions Hearing Foundation and Research Center, Inc., receives come from Virginia's Lions Clubs and individual Lions. Lions' contributions to the Hearing Foundation assist VLHF Medical Director Dr. George Hashisaki and his fellow researchers to continue their research projects and get closer to their ultimate goals.

If your Lions Club did not donate to the Hearing Foundation last year, please do so this year. If your Lions Club did contribute, we need your continued support. Your financial assistance to hearing research is a prime example of your adherence to the Lions motto. We serve with funds as well as with work.

Yours in Lionistic Service,

Don

Lion Don Colley, PCC
Executive Director, VLHF

Cochlear Implants: Worth the Cost?

Amir Allak

Imagine if you lost your hearing tomorrow- what would be different? You wouldn't hear your alarm clock wake you up. You wouldn't hear your child tell you "good morning." You wouldn't hear the birds chirp outside. You wouldn't hear the radio on your way to work. You wouldn't communicate with your coworkers the same way. You wouldn't hear your worship service that weekend. Every minute of your life would change. What would it be worth to you to hear again?

In the United States, 1-3 of every thousand children born and 40-50% of adults above the age of 75 have hearing impairment. Depending on the type and severity of hearing loss, hearing aids can be helpful, but that is not always the case. Cochlear implants are devices developed over the last several decades that help restore hearing in certain patients. A cochlear implant is placed into the cochlea, or hearing organ, that resides in the inner part of the ear behind the eardrum. It takes the sound that it detects and transforms that sound into an electrical signal that stimulates the hearing, or auditory, nerve. The surgery to implant the device has become a very routine procedure and is often well tolerated by patients. In the United States, it is currently approved for ages 12 months and above, and to date about 200,000 devices have been implanted.

An issue that has become more and more prevalent with cochlear implants is their cost- each device, along with the cost of surgery and follow-up costs an estimated \$40,000. Medicare, Medicaid, and insurance companies would be reluctant to pay that much money for any treatment, and, in fact, hospitals often lose money with the amount they are reimbursed for cochlear implantation. Yet we see a large improvement in the quality of life with restoring hearing to those who are hearing impaired. How can we reinforce these benefits to the payers?

In the medical literature, there have been studies that have attempted to compare the improvement in quality of life for certain treatments with their dollar cost. This is called a cost utility analysis and is a sort of 'bang for your buck' type of assessment. Cochlear

implants are one of the treatments that have been studied and, for their cost, have a larger quality of life improvement than knee replacement surgery, heart coronary artery bypass surgery, and heart defibrillator placement.

Here at the University of Virginia, we have a robust cochlear implantation program. With the help of a Virginia Lions Hearing Foundation grant, we seek to take the next step in this cost utility analysis. We will still get the quality of life improvement information for patients who have undergone cochlear implantation using a survey called the Health Utility Index. However, instead of stopping at a comparison of quality of life to cost, we seek to quantify the improvement of hearing and quality of life in dollars. We will determine the improvement in hearing clinically and, using the Social Security Disability index as a scale, will be able to attach a dollar number to a patient's hearing improvement as a proportion of how much the government would pay in disability for hearing loss. Also, we are asking a series of questions about how much it is worth (in dollars) to our hearing impaired patients to hear things such as conversations, traffic, music, television, and other abilities. This will further improve our ability to understand the importance of this treatment and its ability to more than make up for its cost through the life of a patient who has had their hearing restored.

So, after all is said and done, how much is it worth to restore hearing? The answer is simple. More than it costs.

A Short History of Hearing Aids

Since hearing loss is one of the oldest of the known disabilities, attempts to amplify sound go back several centuries. Over time, hearing-aid producers have tried to improve the quality of sound, to develop a smaller device, and in some instances to conceal the device.

Some of the first hearing aids are described by Giovanni Battista Porta in *Natural Magick* in 1588. These hearing aids were made of wood and shaped like the ears of animals known to have acute hearing.

Several centuries ago, speaking tubes were used to collect sounds of people's voices and confine them to

the narrow diameter of the tube so that the sounds did not diffuse but traveled through the tube with less loss of energy. Speech went from the speaker to the listener in concentrated form.

Sailors and others who needed to communicate over considerable distances popularized the use of ear trumpets to improve their hearing. Resembling small megaphones, ear trumpets collected and concentrated sound waves at the ear. Wealthy, hearing-impaired individuals then began to purchase custom-made ear trumpets to aid their own hearing in normal circumstances.

At the beginning of the nineteenth century, companies began to manufacture a great variety of hearing devices, some stylishly designed and constructed of valuable materials and others built of cheap tin or rubber. Most did not work very well.

If a person cups his hand behind his ear, he can increase the strength of sound waves by 5 to 10 decibels (dB). The best ear trumpets could do better than that but could still only help people with mild hearing impairments. Depending on their size and shape, ear trumpets could amplify by about 10-20 dB, with most of this in the range of 500-1000 Hertz (Hz) - — only a small part of the 300-3000 Hz range of human speech. Large trumpets could amplify sound in this range by up to 40 dB, but were heavy and difficult to use.

Auricles and cornets were developed as an alternative to the ear trumpet with the hope that the devices would be less observable on the wearer. A. R. Auricle invented the implement which was smaller than an ear trumpet and which people could wear around their ear. The device resembled a musical instrument, the cornet.

Some aids such as the Audi-Ear and the Super Ear, developed in the 1920s, had headbands and were designed to fit over and under the ear. People thought that these aids would do the same job as placing the hand behind the ear and cupping it to receive sound.

Sounds are transmitted to the ear not only by vibrations in the air but also by vibration of the bones in the skull. This process is called bone conduction, and for some people in need of hearing aids it was the best way to transmit amplified sound. Bone-conduction devices had been tested since the 16th century. The first practical one was the 1879 Rhodes Audiophone, which used a vulcanite fan to pick up air vibrations and transmit them to the teeth. Electric bone-conduction

hearing aids appeared in 1923 and were a major improvement. Today most bone-conduction hearing losses are corrected surgically.

The transition to battery-powered hearing aids occurred in the early 1900s, bringing sound amplification to a broader audience. The earliest electric aids offered the same amplification as ear trumpets did but covered a wider frequency range — sometimes as much as 500 to 1800 Hz. Initially the battery packs were large and were carried in separate boxes or strapped to the user's leg. These early aids were carbon type. Later models with multiple microphones provided 25-30 dB of amplification. The introduction of amplifiers in the 1920s increased the range to 45-50 dB.

Vacuum-tube aids were introduced in 1939. In 1944, the first vacuum-tube hearing aid was developed which contained the battery inside the aid. The first transistor hearing aid was introduced in 1953. With the development of the transistor, hearing aids were able to become smaller and more powerful. In 1985 the use of microchips for programming hearing aids was introduced. Hearing aids today can provide substantially more amplification than before and can be individually tailored to address each wearer's particular hearing loss.

Board of Directors Meeting Schedule

The VLHF board of directors meeting will hold its spring meeting on Saturday, April 16, 2011, in Riggs Auditorium, beginning at 11:00 a.m.

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