



# The Ear Drum

Virginia Lions Hearing Foundation & Research Center, Inc.  
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## Message from the President

Dear Fellow Lions:

Spring is fast approaching and leaving old man winter behind us. Now is the time to put our thoughts in motion to improve the ways of doing business as Lions Clubs. Clubs can assist the UVA medical teams with their research to restore hearing loss in infants and in ourselves as we age. Organize a new fund-raising activity with the proceeds going to the Virginia Lions Hearing Foundation for use in hearing research.

How would each of us cope if we had difficulty distinguishing one sound from another. Our medical team has been very successful in restoring many patients' normal hearing. It is my understanding that researchers are achieving promising results in projects to regenerate human hair cells.

As VLHF President I invite all Lions in MD 24 to attend one of our board of directors meetings to learn more about research into deafness and hearing loss.

Yours in service,

*J. D. Arnold*

Lion J. D. Arnold, PDG

**President, VLHF**

## Executive Director's Message

Lions of MD 24:

Occasionally, a Lion will ask me, "What does the Hearing Foundation do? Is it true that the Hearing Foundation buys hearing aids for needy people in some districts but not in all of them? If so, why?"

The mission of VLHF is to support both basic and applied research into deafness and hearing problems and to conduct outreach to the public and to Lions Clubs about hearing problems and the ways to avoid or lessen them. That is the reason that the Hearing Foundation brings displays to all district fall conferences and state conventions with booklets, pamphlets, brochures, and other handouts for Lions to take back to their clubs. The Hearing Foundation also provides booklets about noise and hearing to Lions Clubs which request them to distribute to the public at community events in which the Lions Clubs participate.

The Hearing Foundation does not purchase hearing aids for individuals who cannot afford them, nor does it pay for hearing exams for those individuals.

Lion Janice Morris, VLHF administrator, does work with UVA audiologists to match Lions Clubs with patients from their service areas who need but cannot afford hearing aids.

Yours in Lionistic Service,

*Lion Don Colley*

**Executive Director, VLHF**

## A Short History of Hearing Aids

Because hearing loss is one of the oldest of the known disabilities, attempts to amplify sound to improve people's hearing go back 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.

Around 1800 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.

## Sound Facts About Noise

About 20% of Americans suffer some degree of hearing loss. At age 65, one-third of us experience impaired hearing.

Of the millions of Americans who have some degree of hearing loss, more than one-half have not had their hearing problems corrected. About one-third of hearing-impaired people can attribute their hearing loss, at least in part, to noise.

More than 30 million Americans are exposed to hazardous sound levels on a regular basis. Individuals of all ages - children, adolescents, young adults, and older people - can develop noise-induced hearing loss. Noise-induced hearing loss can be caused by a one-time exposure to an extremely loud sound, impulse sound, as well as by repeated exposure to sound at various loudness levels over an extended period of time.

Exposure occurs in the workplace, in recreational settings, and at home. Noisy recreational activities include target shooting and hunting, snowmobiling, go-cart riding, woodworking and other noisy hobbies, playing with cap guns and model airplanes, and listening to popular music played at a high audio level.

Sources of harmful noises at home include vacuum cleaners, garbage disposals, gas-powered lawn mowers, leaf blowers, and shop tools. And where the person lives makes no difference. Both urban and rural settings offer their own noise on a daily basis.

The loudness of sound is measured in units called decibels. Normal conversational speech is approximately 60 decibels; the humming of a refrigerator is 40 decibels; and heavy city-traffic noise can be 85 decibels. Sources of loud noises that can cause hearing loss include motorcycles, firecrackers, and firearms, all emitting sounds from 120 to 150 decibels. Sounds of less than 80 decibels, even after long exposure, are unlikely to cause hearing loss.

Exposure to harmful sounds causes damage to the sensitive hair cells of the inner ear as well as to the hearing nerve. These structures can be injured by two kinds of noise: loud impulse noise such as an explosion or loud continuous noise such as that generated in a woodworking shop or by a lawn

mower. The ambient noise level is too high if a person must raise his voice to be heard at a normal conversational distance.

Hearing loss from noise is preventable. All individuals should understand the hazards of noise and should practice good health in everyday life.

- Know which noises can cause hearing damage (those above 85 decibels).
- Wear earplugs or other hearing protective devices when involved in a loud activity (special earplugs and earmuffs are available at hardware stores and sporting good stores).
- Be alert to hazardous noise in the environment.
- Protect children who are too young to protect themselves.
- Make family, friends, and colleagues aware of the hazards of noise.
- Have periodic medical examinations by a physician and hearing tests by an audiologist, a health professional trained to identify and measure hearing loss and to rehabilitate persons with hearing impairments.

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## Board of Directors Meeting Scheduled

The spring VLHF Board of Directors meeting will be held on Saturday, April 2, 2016, in Riggs Auditorium, West Complex, UVA Medical Center, beginning at 11:00 a.m. All Lions are invited to attend this meeting.

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