

The Southside Scene

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In the Livingston Health
 Services Building

Welcome to our newsletter! We hope you will find the information it contains to be helpful, and encourage you to pass it along to friends or family members who might also benefit from it. Please feel free to suggest topics for further newsletters – call us or let us know at your next visit!

Technology Update: Hearing Protective Devices

Hearing Protective Devices (HPDs) come in all shapes and sizes. They can be in the ear, commonly called earplugs. Earplugs can be purchased at most pharmacies and home improvement stores, or hearing centers, or they can be custom made by your audiologist. They can be foam, but attached to strings or headbands as well. They can also be over the ear, commonly called earmuffs, often purchased at home improvement stores. Additionally, HPDs can be specialized according to the activity for which they will be used such as music, hunting, target or skeet shooting, or swimming and water protection (these will even float). They can contain special filters for different frequency responses, or they can even be electronic.

The degree of protection provided by hearing protectors is referred to as the NRR, or noise reduction rating. The noise reduction rating is a number that generally refers to the amount of attenuation (dampening) of sound that an earplug/muff will provide in a clinical environment. Notice the “clinical” word used. This means very strict and controlled environments were used for these ratings to be developed. The general rule of thumb for NRR ratings is two fold: 1. The higher the number of the rating, the greater the degree of protection; and 2. The NRR number should be about halved for the actual degree of protection provided for the general population. For example, if you have an HPD that has an NRR rating of about 30, then the actual attenuation of the HPD for the general population will be approximately 15 dB. This is a fair amount of attenuation, but certainly not as much as the rating suggests.

Of course another factor in the degree of attenuation provided by the HPD is proper use of the device. Unfortunately, HPDs are often used incorrectly therefore providing little or no attenuation or protection. The earplugs are often not inserted far enough into the ear canal for effectiveness, or the earmuffs have “leaks” around the muff allowing for sound to enter. Technically it only takes a gap the size of a pinhole for enough damaging sound to enter into the ear. For the earmuffs, the best illustration of this is to consider wearing a mask over your eyes under water. Any leak in the mask will allow for the water to get in, making the mask ineffective.

The best way to know if the HPDs are in your ears correctly is to test the sound of your own voice. If your own voice sounds very loud to you, and you hear your own body sounds such as your heart beat or breathing, they are most likely in your ears correctly. When I have mine in my ears, my footsteps are very loud to me, and I can hear myself swallow.

There are various types of earplugs. The most commonly used earplugs are the foam yellow plugs made by E.A.R. (brand name). They are fairly inexpensive and comfortable, as well as disposable. The nice thing about these is that they are VERY effective assuming they are put in the ear correctly. There are earplugs that are made of silicon and are molded with your fingers before putting into the ear. These tend to be used for

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TELL YOUR FRIENDS!!!!

Southside Hearing Center will be hosting our 3rd Annual Fall Open House on Tuesday, October 19th AND Tuesday, October 26th, from 10:00 am until 4:00 pm. We will be doing free hearing screenings, hearing aid checks, and hearing aid demonstrations for NEW patients. If you know someone who is in need of one of these services, please have them call our office (585-243-7690) to reserve a time slot for one of the above dates.



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"Dr. Sue" seen here wearing ear muffs for hearing protection

Sue Says...

Noise Induced Hearing Loss

Fall is here. With fall comes the changing of the leaves, the preparation for winter (think noisy leaf blowers, chain saws, and snow blowers), and of course, hunting season. It is not unusual for a hunter to tell me that (s)he prefers not to wear hearing protection while out hunting so that the movement of animals within the woods can be heard. The same is heard from construction workers who may not wish to wear hearing protection so that important communication can take place on the job site; or for industrial workers with similar concerns. Basically, there lies a perceived dilemma for any person who may be exposed to noise either occupationally or recreationally... protect your hearing from damage that may not show itself until later, or be more comfortable (not plugged) at the present. Any audiologist is going to choose the "protect your hearing at all cost" notion simply because we know that we will lose our hearing naturally and should not do anything to hasten the process. You can bet your bottom dollar that I wear my hearing protectors whenever I am mowing my lawn, using any of my noisy yard tools, using my snow blower, or even using my shop vac when I clean out my vehicle.

So why is noise damaging to the ear? Noise, as with all sound, is a physical pressure. Any physical pressure on any organ of the body has the potential to cause damage. The ear is no exception. The correlation is simple... the greater the noise, the greater the pressure. Sound is measured in units called decibels. Decibels are a reference to the physical intensity of sound. To give perspective on the decibel levels of various sounds in our environments...the average conversation is approximately 55 dB (for the tech buffs out there, the reference is hearing levels in dB HL, not SPL); a smoke alarm is approximately 80 dB, a chain saw about 110 dB, and a shotgun or jackhammer approximately 140 dB. Studies and common practice show us that sounds that are consistently over 85 dB for fair periods of time will result in temporary damage, and then ultimately permanent damage. The Occupational Safety and Health Administration (OSHA), which governs safety issues in work environments, including noise control, demands that if a person is exposed to noise of 85 dB for a period of 8 hours, (s)he *should* wear hearing protection, although it is not *required*. However, if the sound is 90 dB over the same 8-hour timeframe, then a worker **MUST** wear hearing protection or the work place can be fined, and disciplinary actions can be taken against any employee who refuses to wear hearing protection.

An important aspect about intensity of sound is that it is not linear. This means that if a person is exposed to 95 dB of noise, the sound is not only "5" units louder than the previously mentioned 90 dB, but exponentially louder and considerably more damaging! OSHA then says that at 95 dB a person must wear hearing protection if exposed consistently for only 4 hours. As the numbers go higher, the amount of allowed exposure time is halved for every 5 dB increase. As the numbers approach 120 and 125 dB, the doubling of hearing protection may be required even if it for a very short timeframe. Percussive sounds such as shotguns and jackhammers (or similar tools) are considered **VERY** damaging. The doubling of hearing protection is the preferred recommendation for these types of sounds as well. I have actually seen pictures of inner ears that have been physically "ripped" apart as a result of these types of noise. This is because of the intense pressure applied to the organ of hearing by the noise.

OSHA was created to protect workers and employers alike. Therefore one can imagine the politics behind the numbers. In hearing prevention efforts however, audiologists tend to be more conservative in protecting our hearing. In general, we know that if the sound is 75 dB, it is potentially damaging to a select number of normal hearing ears. At 80 dB, hearing protection is a good idea. At 85 dB, it is a must. This is different from what OSHA says, but far more preventative and protective!

So how does one know that the noise that one is exposed to is damaging? Since we do not all walk around with a sound level meter, there are a few guidelines that can give you an idea of whether the noise is potentially damaging. First, if one is unable to have a comfortable conversation with a person close by and face-to-face, the noise is possibly too loud and potentially damaging (This assumes ears with normal hearing. A hearing impaired ear will have these difficulties regardless of the level of the noise). Second, if one's ears are ringing following exposure to the noise, even if the ringing subsides after a short time, then the noise has done damage. It is likely that the ears have experienced a temporary threshold shift that may or may not be noticeable following the noise exposure. One may perceive a fullness or deadness to the ears as well. This is a good indicator of a threshold shift with resulting damage. After enough exposure to the noise, often the temporary changes (ringing or hearing loss) become permanent.

There is a distinctive configuration to an audiogram (the graphic representation of your hearing levels) that is typical of hearing loss related to noise exposure. This configuration is called a **noise notch**. The notch is usually centered around 4000 Hz (sometimes 3000 Hz and sometimes 6000 Hz.) A notch means that the greatest degree of hearing loss is at that frequency. The hearing loss at the adjacent frequencies is usually better. A sharp V-shape is then often seen on the audiogram. As time goes by, the "V" starts to

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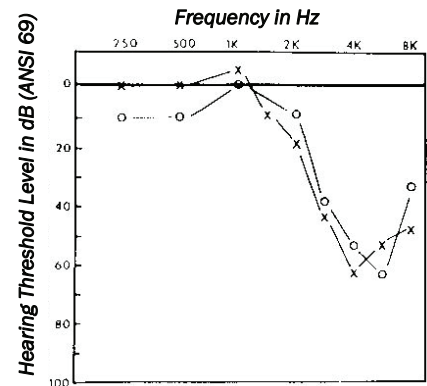
Noise Induced Hearing Loss

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broaden, the adjacent frequencies get worse, and the configuration starts to look like a “U”, or even a ski-slope. The hearing loss will typically be equal in both ears. There are, however, exceptions to this rule. It is not unusual to find a difference in hearing between the ears when a person often shoots long-barreled guns. If the person shoots right handed, the left ear tends to have greater loss, and vice versa. Also, if a noise event such as a firecracker going off in one ear occurs, then the greater loss will be in that same ear.

Encouragingly, there is a lot of research in the area of noise induced hearing loss. The military is often on the forefront of this research. Close by, the University of Buffalo has an exceptional hearing research lab with much of its focus on noise induced hearing loss. Recent discoveries include the use of antioxidants in helping to repair or prevent damage from noise. Additionally, they have found in the past that some people have the benefit of their ears “toughening” when continuously exposed to high level. They have actually likened this phenomenon to an athlete lifting weights and strengthening his/her muscles. Unfortunately this is unpredictable, and certainly not consistent among all people.

So, despite the research and despite the discomfort or inability to communicate comfortably while wearing hearing protection, the bottom line is WEAR YOUR HEARING PROTECTION! (You’ll thank me later!) ■



Typical puretone air-conduction threshold hearing levels for a patient exposed to high noise levels. (Adapted from Maas, 1972)

Technology Update: Hearing Protective Devices

(Continued from page 1)

the purpose of protecting the ears from water. There are earplugs that have 2 or 3 phalanges and made of a rubbery material. The purpose of these is to create a suction-like seal with the ear canal. There are earplugs that are rubbery and look like bullets and may be attached to a string. Earplugs can also be in different colors. They can be orange for safety purposes. They can be flesh colored to be more discreet. They can also be multi-colored to suit the more extroverted crowd and kids.

Custom hearing protectors are excellent for specific activities such as hunting, swimming, music, and even specialty molds for cell phones and other similar devices. The electronic hearing protective devices can be over-the-ear and look like a hearing aid, or look like an in-the-ear hearing aid. The technology is such that sound will be electronically dampened upon loud sounds, but enable a person to hear until the loud sound occurs. The manufacturers of these devices include Walker’s Game Ear and ESP (a.k.a. Electronic Shooters Protection). All of these custom molds or devices are available through Southside Hearing Center.

All of the above HPDs have their pros and cons. Not every HPD is suited for every person. Therefore, sometimes a discussion with your audiologist can guide you to determine what might be best for your ears, hearing and activities. ■



Custom Swim Plugs



Phalange-Style Earplugs



Musician's Plugs



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*Discovering the Human Touch in Hearing
Technology*

WE'RE ON THE WEB!

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Our Mission Statement

Southside Hearing Center, its owner, audiologists and staff are committed to the advancements of hearing healthcare. The Center will provide the most ethical and comprehensive services in Audiology using the most state-of-the-art equipment, procedures and techniques. The Center will provide these services in a clean, healthy and comfortable environment.

Education is at the center of this facility. Southside Hearing Center is committed to educating the patient regarding hearing healthcare issues. Southside Hearing Center is committed to the profession of Audiology, and educating the public that the audiologist is the highest qualified professional in hearing care. Southside Hearing Center will ensure that its staff is equally committed to these causes.

Southside Hearing Center will provide appropriate business in compliance with state and federal laws. Fair business will be this Center's business.

Above all else, Southside Hearing Center will provide THE HUMAN TOUCH to the overwhelming world of hearing impairment.