

# Noise-Induced Hearing Loss: Q&A with Dr. Barry Hirsch

## NOISE-INDUCED HEARING LOSS

A Q & A with AAO-HNS Member Expert Barry E. Hirsch, MD, *Professor, Department of Otolaryngology and Communication Sciences and Disorders, and Neurological Surgery, University of Pittsburgh School of Medicine; Director, Division of Otology; and Chair, AAO-HNS Hearing Committee.*

### **Q. What is noise-induced hearing loss?**

A. Human ears are exposed to noises and sounds every day and in many ways. Usually, the noises we hear are helpful to us, allowing us to engage in conversations, listen to music, and avoid dangerous situations. However, when we are exposed to harmful noises, sounds that are too loud, or loud sounds that last a long time sensitive structures in the inner ear can be damaged, causing noise-induced hearing loss. These sensitive structures, called hair cells, are small sensory cells that convert sound energy into electrical signals that travel to the brain, where the brain converts them into meaningful sounds. Once damaged, hair cells cannot grow back and lose the ability to conduct sound.

### **Q. What are the symptoms of noise-induced hearing loss?**

A. The symptoms of noise-induced hearing loss are subtle in the early stages. Hearing loss tends to occur first for high-pitched (frequency) sounds only. Consequently, the volume of sound heard may be unchanged but the quality of it lessens. Over time, speech may be heard but not completely understood. The presence of background noise can make speech hard to understand. Noise-induced hearing loss can also be accompanied by a ringing in the ears (tinnitus).

### **Q. When is noise dangerous?**

A. Sound is measured in units called decibels (dB). On the decibel scale, an increase of 3 dB means that a sound is two times more intense, or powerful. To your ears, it sounds almost twice as loud. The humming of a refrigerator is 45 decibels, normal conversation is approximately 60 decibels, and the noise from heavy city traffic can reach 85 decibels.

Noise can be dangerous through a one-time exposure to an intense impulse sound, such as an explosion, or by continuous exposure to loud sounds over an extended period of time, such as noise generated in a woodworking shop, fabricating plant, or by loud engines.

Sources of noise that can cause noise-induced hearing loss include motorcycles, firecrackers, and firearms, all of which can emit sounds from 120 to 150 decibels. Long or repeated exposure to sounds at or above 85 decibels can cause hearing loss. The louder the sound, the shorter the time period before NIHL can occur. Sounds of less than 75 decibels, even after long exposure, are unlikely to cause hearing loss.

Here are some basic rules to follow if you are concerned about dangerous noise:

- If it is necessary to shout to hear yourself or someone else over noise, the level of the sound can be damaging.
- Should ringing in the ears occur after exposure to a loud sound, damage has been done and that sound should be avoided or ear protection used in the future.
- If diminished hearing or a sense of fullness in the ears is experienced after noise exposure, the level of that noise is damaging.

### **Q. How can I protect my hearing?**

A. Some helpful tips:

- If you work in noisy places or commute to work in noisy traffic or construction, choose quiet leisure activities instead of noisy ones.
- Develop the habit of wearing earplugs or ear muffs when you know you will be exposed to loud or prolonged noise.
- Earplugs and/or ear muffs can effectively reduce sound energy hitting your ears by about 25 dB and can mean the difference between dangerous and safe levels of noise.
- Try not to use several noisy machines at the same time.
- Keep personal music players (mp3 players) and personal gaming device headsets, television sets, and stereos on a low volume.