

You and Your Hearing

Importance of hearing

Hearing allows you to be involved with the world around you. As a young child, you learned to speak by listening to and imitating the voices of others. Babies who are deaf have a hard time learning to speak clearly. You have learned most of what you know by listening to parents and teachers, television and radio. Music, the sounds of nature and the voices of loved ones can bring you pleasure; sirens and alarms can warn you about danger, even when you are asleep.

Structure of the ear

The human ear is divided into three parts—the external, middle and inner ear. The inner ear is located inside the skull. It is the most complex part of the ear. The soft tissue of the inner ear is made of sensory cells, supporting cells and nerve fibers, all arranged in a pattern on a thin, elastic membrane (a thin sheet of tissue). Large channels filled with fluid surround the soft tissue of the inner ear.

What are the effects of noise?

Aging, some drugs, head injuries and too much noise can all cause lasting damage to hearing. This handout discusses the most common type of permanent hearing loss—the loss that results from too much noise.

Long exposure to noise can damage the soft tissue of the inner ear. Sensory cells and nerve fibers are destroyed by continuous or repeated exposure to loud sounds. If enough sensory cells and nerve fibers are destroyed, hearing is permanently damaged.

Whether noise harms your hearing depends on the loudness, the pitch and the length of time you are exposed to the noise. The loudness of a sound—measured in decibels (dB)—and the length of exposure are related; the louder the sound, the shorter the exposure can be before damage occurs. For example, eight hours of exposure to 85-dB industrial noise on a daily basis is considered safe for most persons' ears. However, using power tools (at about 100 dB), listening to stereo headsets (at about 110 dB) or attending a rock concert (at about 120 dB) may damage the hearing of some people after only a few times.

What are the symptoms of noise-induced hearing loss?

One reason people fail to notice the danger of noise is that excess exposure to noise causes few symptoms. Hearing loss is rarely painful. The symptoms are usually vague feelings of pressure or fullness in the ears, speech that seems to be muffled or far away, and a ringing sound in the ears that you notice when you are in quiet places. These symptoms may go away minutes, hours or days after the exposure to noise ends.

People assume that if the symptoms go away, their ears have “bounced back” to normal. This is not really true. Even if there are no more symptoms, some of the sensory cells in the inner ear may have been destroyed by the noise. Your hearing returns to normal if enough healthy sensory cells are left in your inner ear. But you will develop a lasting hearing loss if the noise exposure is repeated and more sensory cells are destroyed.

The first sign of a noise-induced hearing loss is not hearing high-pitched sounds, like the singing of birds, or not understanding the speech of women and small children. If the damage goes on, hearing declines further, and lower pitched sounds, including men’s voices, become hard to understand.

How can you decide which noises are too loud?

The following signs should be a red flag that the noise around you is too loud:

- If you have to shout to be heard above the noise.
- If you can’t understand someone who is speaking to you from less than 2 feet away.
- If a person standing near you can hear sounds from your stereo headset while it is on your head.

How can I prevent noise-induced hearing loss?

- **Reduce your exposure to noise.** This step is especially important for people who work in noisy places and who go to and from work in noisy city traffic. You can reduce your exposure to noise by choosing quiet leisure activities rather than noisy ones.
- **Develop the habit of wearing earplugs** when you know you will be exposed to noise for a long time. Disposable foam earplugs cost about \$2 a pair and are available in drugstores. These earplugs, which can quiet up to 25 dB of sound, can mean the difference between a dangerous and a safe level of noise. You should always wear ear plugs when riding snowmobiles or motorcycles, when using power tools, lawn mowers or leaf blowers, or when traveling in loud motorized vehicles.

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- **Use sound-absorbing materials** to reduce noise at home and at work. Rubber mats can be put under noisy kitchen appliances, computer printers and typewriters to cut down on noise. Curtains and carpeting also help reduce indoor noise. Storm windows or double-pane windows can reduce the amount of outside noise that enters the home or workplace.
 - **Don't use several noisy machines at the same time.** Try to keep television sets, stereos and headsets low in volume. Loudness is a habit that can be broken.
 - **Don't try to drown out unwanted noise with other sounds.** For example, don't turn up the volume on your car radio or headset to drown out traffic noise or turn up the television volume while vacuuming.
 - **Have your hearing checked.** Children should visit an audiologist (a hearing expert) before they start kindergarten. Persons at risk for hearing loss should have their hearing tested every year. You are at risk if you are regularly exposed to loud noise at work or play. Babies in families with a history of hearing problems and children who have chronic ear infections are also at risk.

This handout provides a general overview on this topic and may not apply to everyone. To find out if this handout applies to you and to get more information on this subject, talk to your family doctor.



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