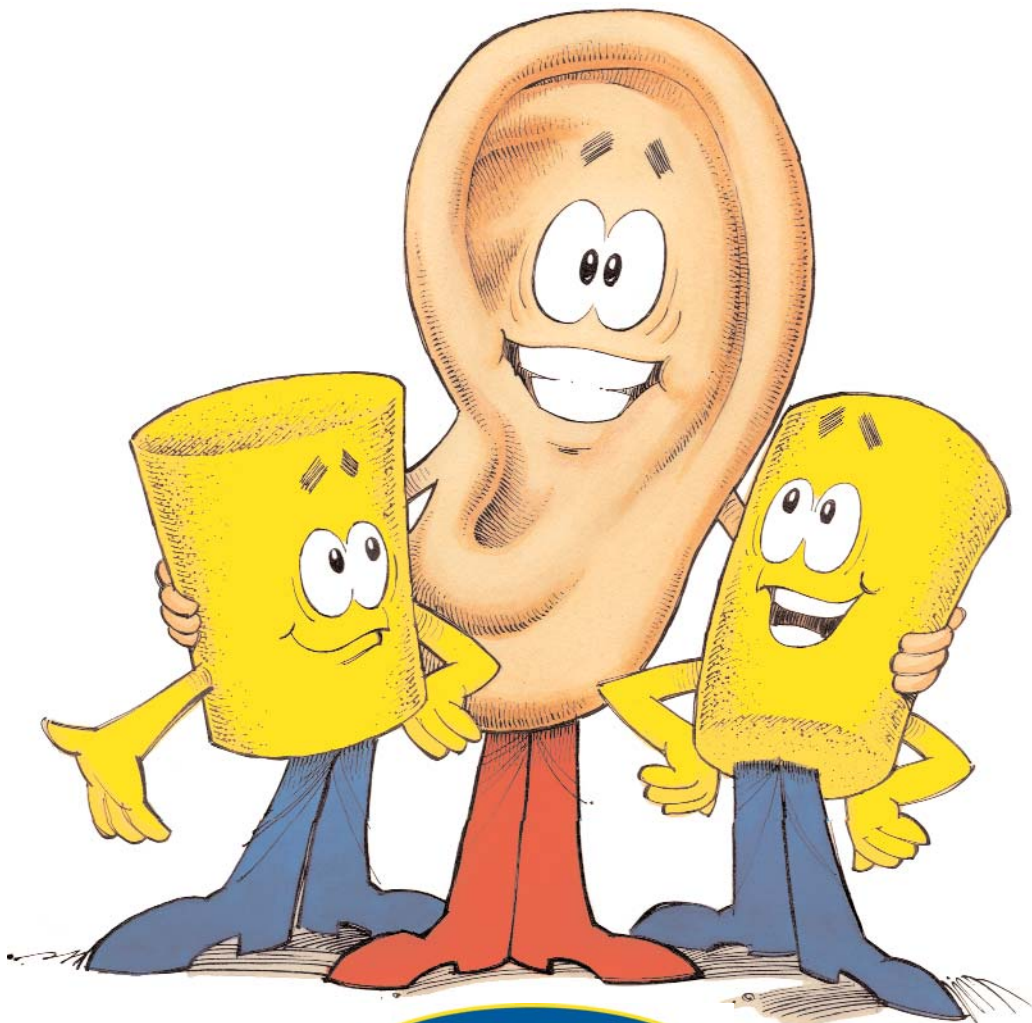

An Earful Of Sound Advice

About Hearing Protection



Your Hearing Conservation Program

It's a noisy world we live in today — at work and at play. Unfortunately, some of that noise may damage your ears and prevent you from hearing important sounds tomorrow. To help protect your hearing, your employer has established a hearing conservation program. It should include at least **five phases: sound surveys, noise controls, hearing evaluations, hearing protection, and education.** Now it takes your participation to succeed.

Sound Surveys

Sound surveys are used to identify work locations where hazardous noise levels exist. Employee exposures to noise are monitored periodically with a **sound level meter** or with a **noise dosimeter** that you may be asked to wear.

Noise Controls

When possible, noise will be reduced or eliminated by modifying existing machinery and placing noise limit specifications on new equipment.

You can do your share by maintaining equipment in good operation, properly using noise controls when installed, and reporting noisy equipment to your supervisor when it needs attention.



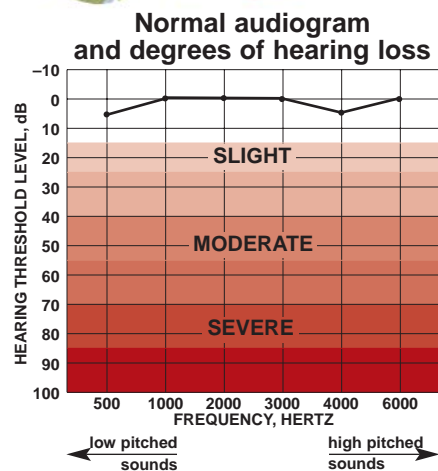
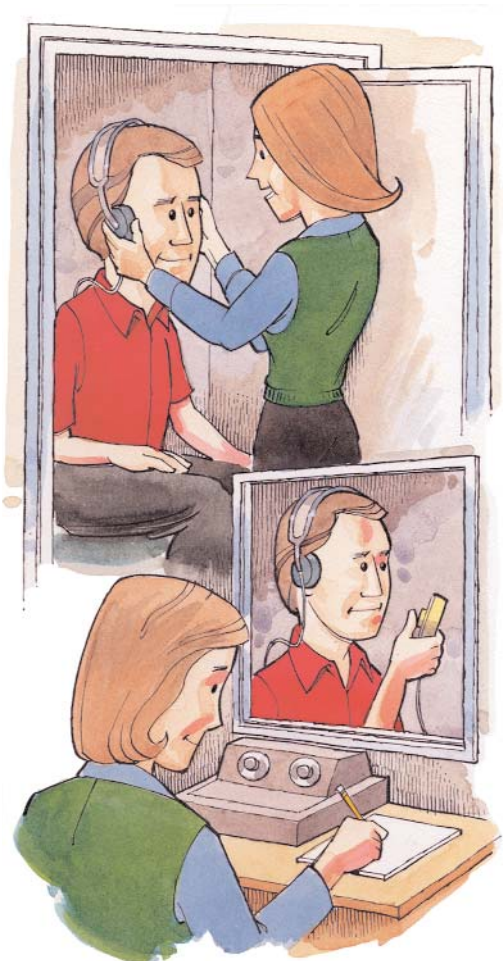
Hearing Evaluations

Hearing is measured with an **audiometer** which sends tones to each ear through headphones. You listen carefully and respond each time you hear a tone. The levels at which you can barely hear the tones are your **hearing threshold levels**.

The audiogram chart records your thresholds (measured in decibels) for tones at different pitches or frequencies (measured in Hertz). Normal thresholds fall within the unshaded area on the chart. When hearing loss occurs the thresholds fall into the shaded areas, meaning sounds must be increased in level for you to hear them.

A **baseline audiogram** shows your initial hearing status, for comparison to future audiograms. **Periodic audiograms** provide an update to determine if your hearing conservation program is doing its job and if non-noise factors are affecting your hearing. A recheck audiogram or a professional referral may be needed if a significant hearing change occurs.

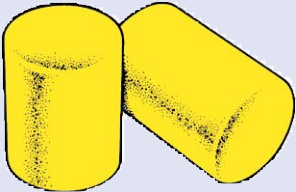
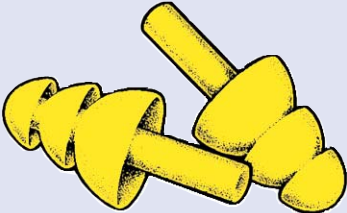
Periodic hearing evaluations show how your hearing compares to normal for your age. They are the only way to determine whether your hearing is being conserved. Unusual changes alert you and your employer to look for noise-related or medical causes before it's too late.



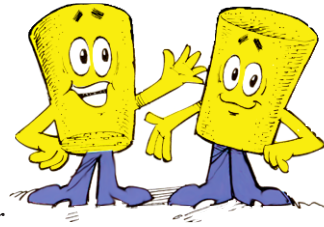
Hearing Protection

Hearing protectors can be very effective **but only if they fit properly and are worn correctly**. Although labeled Noise Reduction Ratings (NRRs) typically range from 20-35 decibels, in practice the protection that normally can be achieved is about 10-20 decibels.

The more carefully you select and wear hearing protectors, the higher your protection will be. Hearing protectors may feel uncomfortable at first, but give yourself a chance to get used to them, just as you do with a new pair of shoes or glasses.

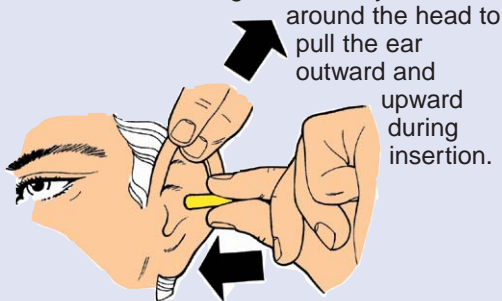
Protector Type	Description
<h3>Formable Plugs</h3> 	Formable plugs are compressed or shaped prior to insertion. The most popular variety is made of expandable, slow-recovery foam. One size fits most everyone. Once in the ear, foam plugs gently expand to provide a snug and secure custom fit .
<h3>Premolded Plugs</h3> 	Premolded plugs are made from flexible materials that are preformed to fit the ear. They are generally available with a joining cord to prevent loss. Although the version pictured at the left is a one-sized product, many premolded plugs are sold in two or more sizes and must be individually sized for each ear . If after a week or so you've been unable to get used to your earplugs, check with the fitter to try another size, type, or brand of hearing protector.

Earplug Fitting Tip. Press firmly cupped hands over your ears while listening to a steady noise. With properly fitted plugs the noise levels should be about the same whether or not the ears are covered.



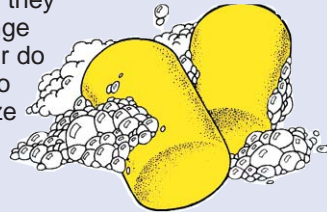
How to Use

Slowly roll and compress foam plugs into a very thin cylinder. While compressed, insert plug well into the ear canal. Fitting is easier if you reach

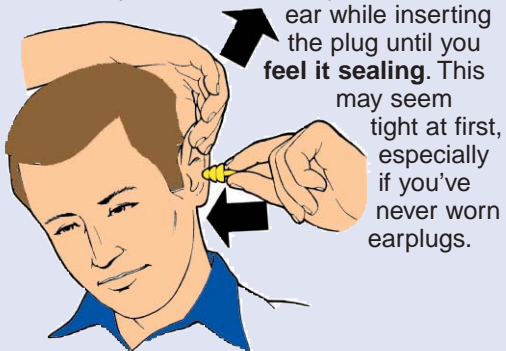


Care & Cleaning

Keep the plugs clean and free from material that can irritate the ear canal. They may be washed in mild liquid detergent and warm water. Squeeze excess water from the plugs and air dry. Washing may be repeated several times. Discard plugs if they noticeably change their firmness or do not re-expand to their original size and shape.



Reach around the back of your head and pull outward and upward on the ear while inserting the plug until you **feel it sealing**. This may seem tight at first, especially if you've never worn earplugs.



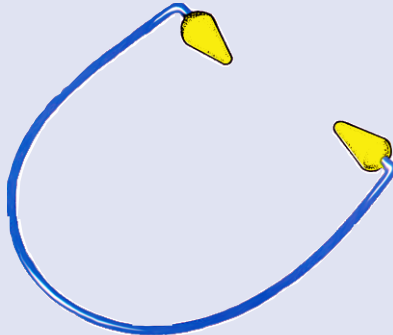

Premolded plugs will normally last several months or more depending upon the type, and upon your work environment, hygiene, and body chemistry. They should be replaced if they shrink, harden, tear, crack, or become permanently deformed. Wash them in warm soapy water and rinse well. When dry, store them in a carrying case.



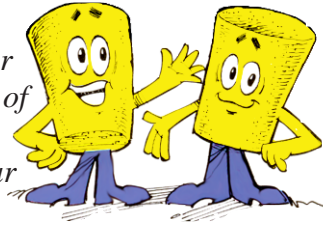
Hearing Protection

Initially you may be concerned that you'll be unable to hear conversation, machinery sounds, and warning signals while wearing hearing protection. However, unless you already have a significant hearing loss you'll be surprised how well you can hear while in noise. And when you properly wear

hearing protectors you'll be able to hear as well at day's end as when you started in the morning. People with hearing loss also benefit, since without protection noise will continue to damage their hearing until it is difficult to distinguish sounds under even the best of conditions.

Protector Type	Description
<h3>Semi-insert Device</h3> 	Semi-inserts, also called canal caps, consist of pods or flexible tips on a lightweight headband. Because they are quick to put on and take off and easy to store around the neck, they are ideal for intermittent use . They provide less protection than either plugs or muffs and aren't usually recommended for continuous long-term wearing.
<h3>Earmuffs</h3> 	Earmuffs have rigid cups with soft plastic cushions that seal around the ears to block noise. Foam-filled cushions are usually preferred over liquid-filled versions because they are lighter, more durable, and equally protective. For very loud noises, wear muffs and plugs together for an additional 5-10 dB or so of protection.

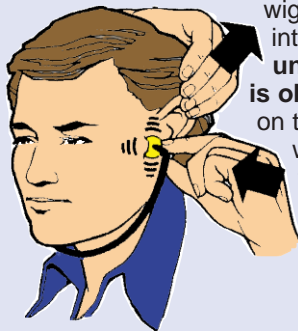
Hearing Protector Fitting Tip. When either a plug or muff is properly fitted, the sound of your own voice should change, becoming deeper, hollow, or muffled. If you don't hear the change, or if it isn't the same in both ears, you haven't obtained a proper fit and acoustic seal in either one or both ears.



Tip: Talking in noise. When you wear plugs or muffs in noise you tend to speak less loudly than otherwise because the protector makes your own voice seem louder and the surrounding noises seem quieter. So, you have to **speak up** — speak more loudly than you think you need to. Others will appreciate this, and your message will be better understood.

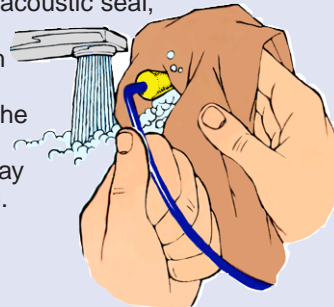
How to Use

Hold the large ends of the pods and swivel them to direct the tips into the ear canal openings. Firmly push and wiggle the pods into the canals until a snug seal is obtained. Pulling on the outer ear while pushing on the pods will be helpful to most wearers.



Care & Cleaning

Most semi-inserts can be cleaned in the same way as premolded earplugs. Since the headband holds the tips in place to provide an acoustic seal, don't tamper with it or the protection the device provides may be reduced.



Muffs must **fully enclose the ears to seal against the head.** Adjust the headband so cushions exert even pressure around the ears to get the best noise reduction. Pull hair back and out from beneath the cushions. Don't store pencils or wear caps under the cushions.



Cushions can be cleaned with warm soapy water and rinsed thoroughly. Do not use alcohol or solvents. Cushions normally need replacing twice a year or more - whenever they become stiff, cracked, or do not seal. Don't modify earmuffs in any way, and especially do not stretch or abuse the headbands as this will reduce your protection.



Your Hearing

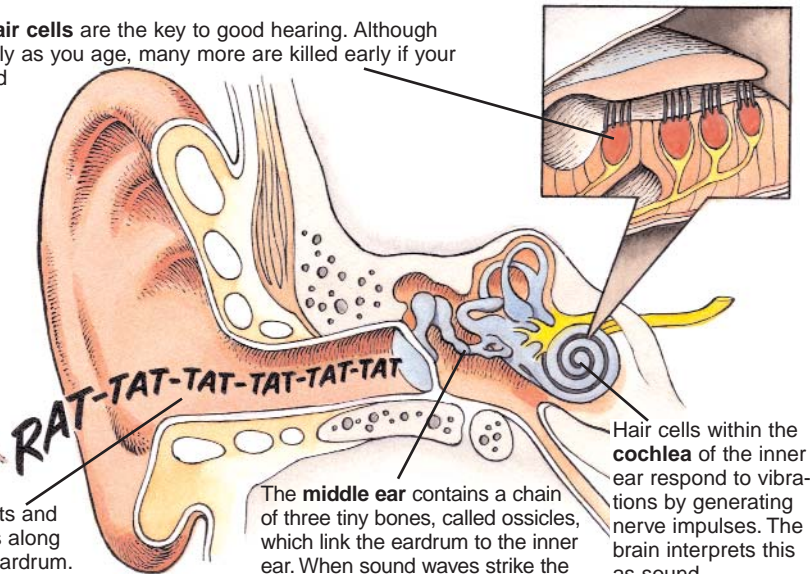
Why and when to protect it

How We Hear

Healthy inner-ear **hair cells** are the key to good hearing. Although some die off naturally as you age, many more are killed early if your ears aren't protected from harmful noise.



The **outer ear** collects and funnels sound waves along the ear canal to the eardrum.



The **middle ear** contains a chain of three tiny bones, called ossicles, which link the eardrum to the inner ear. When sound waves strike the eardrum, the ossicles conduct the vibrations to the cochlea in the inner ear.

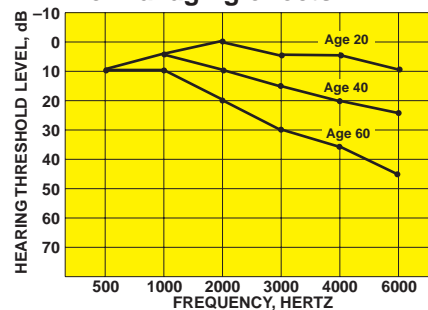
Hair cells within the **cochlea** of the inner ear respond to vibrations by generating nerve impulses. The brain interprets this as sound.

Effects of Age and Noise on Hearing

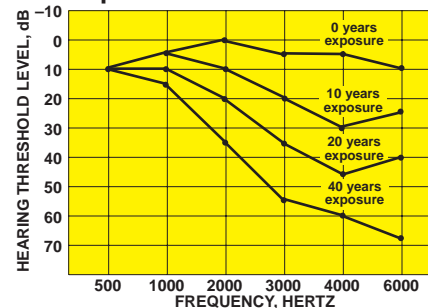
Hearing loss from the natural aging process causes a gradual hearing decline, as shown in the figure to the right. It affects mainly the ability to clearly hear high-pitched sounds such as children's voices, rustling leaves, and some musical instruments.

Although age-effect hearing loss up through age 60 does not usually impair one's ability to hear and understand speech, problems occur when noise-induced loss is added to age loss. With noise damage, even a 30-year-old can have trouble listening in situations in which background sound is present, such as in restaurants and other social situations.

Normal aging effects*



Loss from aging plus noise exposure at 95 dBA*



*The trends are less severe for females.

You Don't Get "Used to Noise"

Noise does not have to be uncomfortably loud to be damaging. You may even think your ears are "used to the noise," but what has probably happened is that hearing loss has already begun. How quickly hearing loss occurs depends on the **intensity** of the noise, its **duration**, and **how often** the exposure occurs.

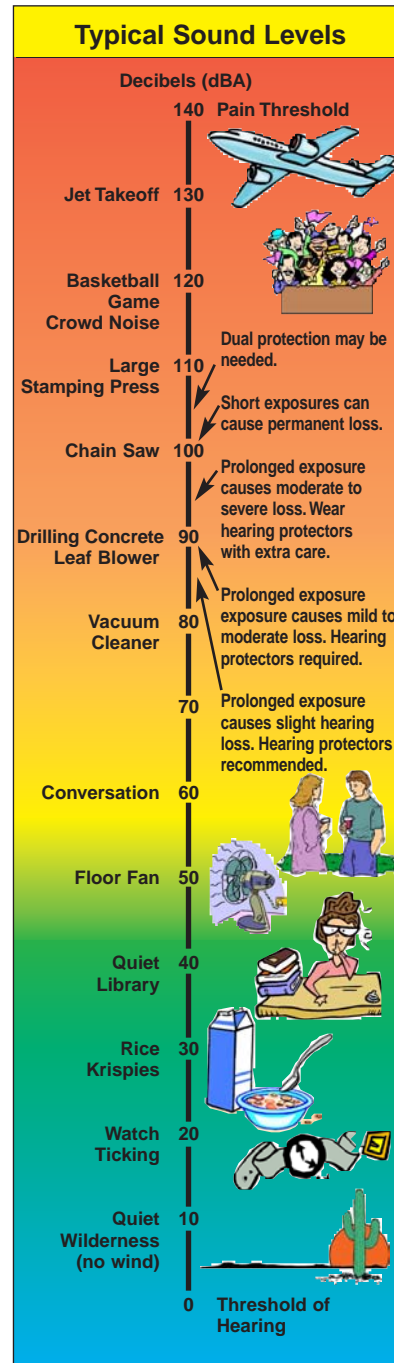
A Rule of Thumb

When you feel the need to shout in order to be heard three feet away, the noise levels are probably 85 dBA or more and hearing protectors are recommended.

Noise Damage Indicators

If sounds seem muffled or softer after noise exposure, your hearing is affected by a **temporary threshold shift** which warns that your ears have been overexposed. If you repeatedly expose your ears without protection, the shift can worsen and become permanent, resulting in untreatable damage to your hearing ability.

Another warning sign is **tinnitus** — a ringing, buzzing, or whistling in your head. It's like a "sunburn" of the hair cells of your inner ear, indicating that they have been irritated and overworked. Tinnitus is especially noticeable in a quiet place, such as when trying to go to sleep at night. If you don't protect your ears from noise, tinnitus can become a permanent, constant annoyance in your life.



Do Yourself A Favor — Save Your Hearing!

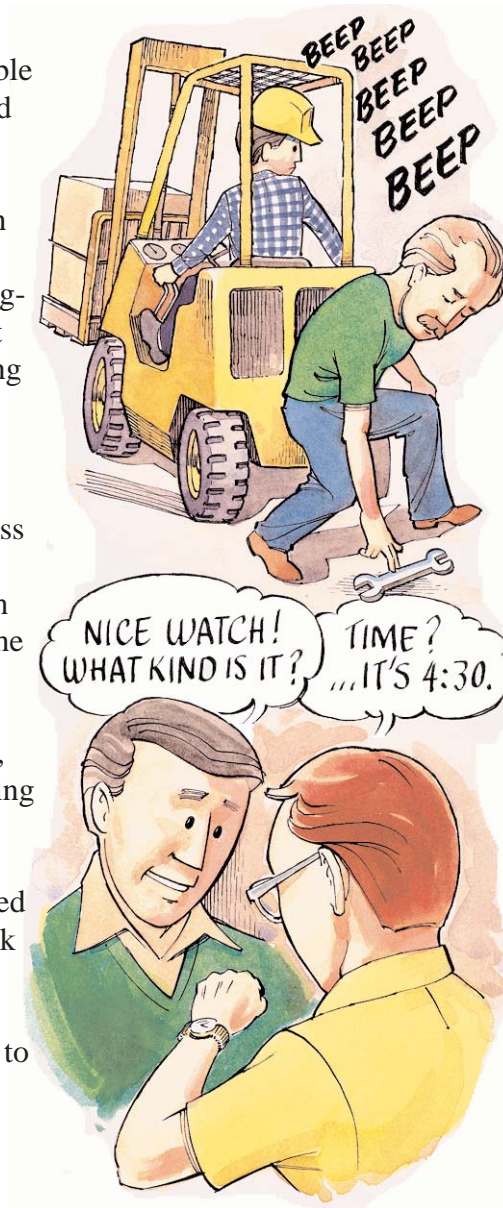
Sounds You Want to Hear

A hearing-impaired person may not be able to enjoy birds singing or cats purring, and distortion from damaged hair cells may make music seem like “just a racket.” It becomes difficult to detect problems with tools or car engines by listening for changes in the sounds they make. Hearing-impaired people worry about getting hurt by missing danger signals such as warning beepers.

Person-to-Person Communication

Most important, a person with hearing loss may not hear or understand family members and friends, particularly women and children with high-pitched voices. The individual will confuse similar-sounding words and mistake the message.

Embarrassed to ask the speaker to repeat, the listener may just “tune out.” Conversing in groups is most difficult, especially if there is background noise. People with hearing loss often become socially isolated as others find it too much trouble to speak to them. What’s more, hearing aids can’t completely correct the problem because louder sounds are not necessarily clearer to the damaged ear.



Keep Track of Your Hearing

Check your current audiograms against past results. Pat yourself on the back if your thresholds are stable. If your thresholds are changing, a professional will review your audiograms along with information about your ear health and noise exposures to identify possible causes. If hearing changes appear to be noise-related, your employer may suggest different hearing protectors, retrain you in their use, or recommend you wear them during off-the-job exposures.

Remember: You Need Your Hearing!

These comments from people with noise-induced hearing loss show why it is worth the effort to properly wear hearing protectors: your quality of life depends on keeping your good hearing. Once hearing is lost it is gone forever.

Even if you already have some hearing loss, it is still essential to wear hearing protectors from now on to prevent the loss from worsening. It's never too late to start conserving your hearing!



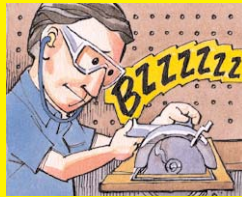
Noise Is All Around

Noise doesn't stop after leaving the workplace, and neither does the need for hearing protection. Be aware of noisy situations so you can protect yourself and enjoy a lifetime of good hearing.



Gunshots.

Protection is needed when shooting at both indoor and outdoor ranges.



Power Tools.

Semi-insert devices or earmuffs can be effective and convenient protection for these intermittent exposures.



Chain Saws.

Hearing protection is a must whenever operating a chain saw.



Aircraft.

When flying in small aircraft, foam earplugs or other hearing protectors are suggested.



Music.

If it's too loud, even music can be harmful to you hearing. Keep a safe distance from loudspeakers, and if necessary, wear hearing protection.



Radio Headphones.

Be smart — keep the music turned to safe levels. As a rule of thumb, while listening to headphones you should still be able to hear others speaking to you from a few feet away.



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