

SAFETY BRIEF: HEARING CONSERVATION

Most of us take our sense of hearing for granted—we assume that we hear what everyone else hears. Loss of hearing may not be realized. This is because hearing loss is usually gradual. Normally, it does not hurt, so we do not even realize it is happening. It is not as noticeable as losing your vision over time.

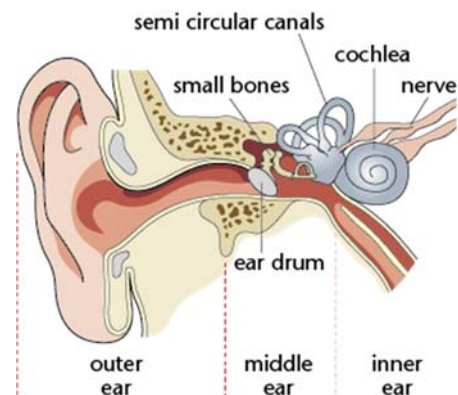
Your ability to hear when you want to is precious and should be protected. Engineering controls can reduce the amount of noise in the workplace by enclosing or muffling loud machinery, but they usually cannot eliminate it entirely. Whatever the length of time you work in an area with high noise levels, you are probably required to wear a type of hearing protection. Some people consider this a nuisance. The more you know about your ears, however, the more likely you will take responsibility for protecting them.

According to the National Institute for Occupational Safety and Health, 22 million workers are exposed to potentially damaging noise each year. In turn, \$242 million is spent every year on workers' compensation for hearing loss, per OSHA. As a result, OSHA has implemented numerous rules, regulations, and worker protections to mitigate noise hazards in the workplace.

The purpose of this safety brief is to help you understand how to protect yourself and your employees and comply with current OSHA regulations as it pertains to hearing conservation. Certain protective measures including, but not limited to, engineering controls and personal hearing protection may be mandatory.

Ear Structure:

In order to understand hearing loss, it is helpful to understand the anatomy of the ear. The outer ear concentrates sound waves and channels them to the eardrum. The eardrum vibrates in response to the sound waves that strike it. Tiny bones in the middle ear convert these sound waves to mechanical vibrations. This creates waves in the inner ear fluid that stimulate thousands of hair cells that translate these vibrations into electrical impulses, which are then transmitted to the brain for interpretation and action.



The hearing process is extremely complicated, delicate and many things can damage your hearing. Loud sound or noise can damage those tiny hair cells and when these hair cells are damaged, they bend over like grass that has been stepped on. Eventually, they will straighten up, but frequent exposure causes the cells to be permanently damaged. Some cells die off naturally with age and noise damage. You cannot replace these tiny hair cells in your ear when they become permanently damaged. There is no medical solution other than hearing aids.

Noise exposure both on and off the job can damage your hearing. The critical sound level when hearing protection should be worn is **85 decibels (dBA)**, established for an 8-hour time weighted average. The louder and longer your exposure, whether at work, at home, or during recreation, the more likely your

hearing will be damaged. If you want to have a sense of "how loud is loud," the following examples, along with their decibel rating, will give you an idea:

30dBA	a soft whisper
40dBA	quiet office, library
50dBA	rainfall
60dBA	normal conversation
85dBA	handsaw
105-110dBA	power saw, snow blower
120dBA	chain saw, ambulance siren
140+dBA	nearby jet engine, gunshot (this level causes pain)

The best course of action to protect your hearing is to use personal protective equipment (PPE). There are many different types of hearing protection PPE and options to provide the best comfort and fit. People have different size ear canals, so one size does not always work for everyone. Get input from your workers on which products feel the best. Remember, nobody will wear a hearing protector that is not comfortable, and the only way to predict comfort is to let your workers try out the products.

Hearing Personal Protective Equipment (PPE):

Disposable foam plugs expand and conform to the shape of your ear. Simply roll the plug into a smooth tube thin enough to fit halfway into your ear canal. Workers in particularly dusty or dirty environments should be sure that their hands are clean when doing this.



Premolded reusable earplugs are constructed of silicone, rubber, or plastic. Many are available in different sizes to fit every ear canal. These types of plugs are inexpensive, reusable, washable, and convenient to carry. They may also be a better option for workers in dusty or dirty environments because the plug can be inserted without having to handle the tip of the plug. If you are wearing reusable earplugs, keep them clean and sanitized and store them in a clean case or bag when not in use. If your earplugs become damaged, get new ones.



Canal caps or hearing bands are basically earplugs connected to a plastic band. The bands are available in several different styles that can be worn behind the neck or under the chin. Workers can hang the band around their neck when it is quiet and insert the plugs when the noise starts up. These bands are also a good idea for workers who are in and out of hazardous areas throughout the day. However, sometimes the pressure from the bands can get uncomfortable. Experiment with different bands to find the best one for each user. You may want to consult with an audiologist for employees that are exposed to high volumes of noise.



Earmuffs block out noise by completely covering the outer ear. Muffs come in several different styles including “low profile” with smaller ear cups or “high profile” with large ear cups for extremely noisy situations. Get a good seal around the ear to get the most out of earmuffs. If you wear glasses or chew gum, the earmuffs can leak noise.



The noise reduction rating (NRR) is usually marked on the package or on the box if they come in bulk. However, since the NRR is established in a laboratory with perfectly fitted plugs, experts recommend that the true rating is generally about 7 decibels less than indicated. Hearing protectors of the earmuff type are usually closer to the actual NRR but they are more costly.

Hearing Conservation Programs

[OSHA’s standard for occupational noise exposure](#) (29 CFR 1910.95) establishes limits on workplace noise exposure. Whenever noise exposure levels reach a time-weighted average sound level of 85 decibels for eight hours or longer (or 90 decibels in the construction industry), employers must take steps to protect employee health. It is at that juncture that an employer must draft and adopt a hearing conservation program. Hearing conservation programs strive to prevent initial occupational hearing loss, preserve and protect remaining hearing, and equip workers with the knowledge and hearing protection devices necessary to safeguard themselves. In order to develop a hearing conservation program and protect employee health, you will need to complete the following:

- Conduct monitoring, sampling, and annual audiometric testing with noise monitoring devices also known as decibel meters. These meters should be used quarterly in noisy work areas and recorded on a log. There are many types of decibel meter devices to measure noise levels. Some are more accurate than others so it is wise to do some research on decibel meters before you purchase one.
- After monitoring, notify employees whenever time-weighted average sound levels reach 85 decibels for eight hours or longer.
- Initiate a baseline hearing test with a clinical audiologist for all employees that are exposed to routine loud noises at work. In Alaska, there are a handful of clinics that offer mobile audiology services to help offset the costs of travel to and from Anchorage.
- Implement procedures for workers whose tests reveal hearing loss after annual hearing testing.
- Offer annual training that educates employees on the hearing conservation program, the effects of noise on hearing, the purpose of hearing PPE, and the rationale for testing.
- Provide (and evaluate) hearing protection PPE. This may include earmuffs, earplugs, or a combination of the two. Employees should also receive instruction for fitting, testing, and training for proper use.
- Maintain records and logs. Record keeping is required for hearing conservation programs. Records must be accurate and you must retain these records for five years.

Remember, hearing loss is not curable but it is preventable. Try to **always** wear hearing protection at work and at home when you are exposed to loud noise levels! Visit this OSHA site to download OSHA publication 3074, Hearing Conservation, a comprehensive guidelines and instructions how to mitigate hearing damage in the workplace: <https://www.osha.gov/sites/default/files/publications/osh3074.pdf>.



Additional training is available through the AMLJIA Online University at www.amljia.org. Log on to the Online University for courses related to this topic such as Hearing Conservation (HP61) and Personal Protective Equipment (SH13). For more information about the Online University, contact the AMLJIA at 800-337-3682.