

HEARING CONSERVATION PROGRAM

Your hearing: Use it, don't lose it

Most of us take hearing for granted. When we go home after work and when we get up in the morning, we expect to hear. Human hearing is amazingly sensitive. Our ears can distinguish 400,000 different sounds and can detect sounds so quiet they cause the eardrum to vibrate less than 1/80 millionth of an inch. But that remarkable sensitivity does not have a lifetime guarantee.

To maintain your hearing, you have to care for it. Noise is as much a part of our lives as the air we breathe. In this guide, noise means sound that interferes with one's hearing. We are exposed to noise at work, at home, and at play. Yet, our ability to hear well offers few clues when we put it at risk.

Noise-induced hearing loss is the term for hearing damaged by exposure to excessive noise. The damage to hearing caused by too much noise may not be apparent for years.

Hearing loss cannot be cured, but it can be prevented.

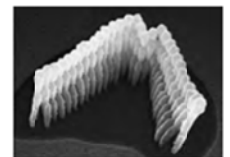
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How does sound damage hearing?

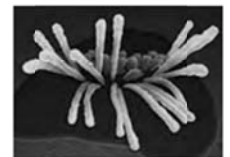
Very loud sounds can damage the sensitive hair cells in your inner ear. As the number of damaged hair cells increases, your brain receives fewer impulses to interpret as sound. When you damage hair cells, you damage hearing.

While a single exposure to loud sounds can damage your hair cells, it probably will not destroy them. You may experience ringing in your ears and some sounds may be muffled, but your hair cells will likely recover and so will your hearing. This is called a temporary threshold shift.

Repeated exposures to loud noise can damage hair cells to the point that they will not recover. Because the damage is permanent, the result is called a permanent threshold shift. Currently, there are no treatments that can restore noise induced hearing loss.



Healthy



Damaged

When engineering controls, administrative controls, and hearing protectors are required

If your workplace has noise levels that are greater than those shown in the table below, you must use engineering controls or administrative controls to reduce employee exposures. This applies to all exposed employees, including those with hearing impairments. If these controls are not enough, your employees must also use hearing protectors to reduce their exposures to these levels.

Exposures below 95 dBA may seem annoying and not loud enough for hearing protection, yet cumulative exposure can lead to hearing loss. Noise levels above 100 dBA, however, are uncomfortable and the discomfort serves as a reminder to protect your hearing.

Hours of exposure	Sound level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25 or less	115

About engineering controls

When you replace a noisy machine with a quiet one, modify it to make it quieter, or change the sound path so that the noise never reaches the listener, you are using an engineering control. Workplace safety and health specialists will tell you that engineering controls are the best way to control noise. That is true only if the engineering control is effective, practical, and affordable. Applying engineering controls to a noise problem can be challenging because ready-to-order solutions may not be available. You are more likely to find a workable solution when you:

- Understand what is causing the noise
- Determine how the noise is reaching the worker
- Identify where to control the noise: at the source, along the sound path, or at the worker

Creative engineering solutions may also be the best ones. Here are two examples:

Build an enclosure: Construction workers were using a concrete mixer to degrease metal parts by tumbling them in sawdust – effective, but noisy. To reduce the noise level to below 85 decibels, the employer built an enclosure around the mixer with two-by-fours and an acoustic sound board, sealing the access door with polyurethane foam. The cost was minimal and the design was effective; it lowered noise levels to a safe 78 decibels.

Ways to reduce noise

Barriers →



Increase the distance: By increasing the distance between the worker and the sound source, you can significantly decrease the sound pressure level. For example, a hazardous 96-decibel noise source at five feet from the listener is a safer 84 decibels at 20 feet.

Once you’ve determined the noise levels throughout your site, you can institute controls to minimize the hazardous noise. Scott Schneider¹ of the ANSI/ASSP A10.46 Subcommittee encourages any efforts to begin with engineering controls to create an overall quieter working environment. “If you’re using engineering controls, you can easily use a sound level meter or an app on your phone to see how loud noise levels are and if you’re effectively reducing them,” says Schneider.

¹ <https://www.assp.org/news-and-articles/2020/03/17/preventing-hearing-loss-in-construction-and-demolition>



[PP 10/11/2020 - 10/24/2020] BCA IIPP Tailgate Topic Review

“If we can provide a quieter work environment, that’s better for everybody,” he says. “It means that you’re protecting workers from hearing loss, and it’s easier to communicate on the job site to protect workers from safety hazards.”

Engineering controls could include retrofits or mufflers for older equipment, or siting equipment away from workers. Some pieces of noisy equipment, such as an air compressor, can be sited 10-to-15 feet away from where work is being performed. You can also rotate workers between noisier tasks and quieter tasks to minimize their risk.

Along with minimizing noise levels, engineering controls can also help you evaluate your noise reduction program. BCA inspectors should meet with contractors at noisy jobsites to seek solutions regarding how to reduce or eliminate them.

About administrative controls

Unlike engineering controls, which eliminate the source of the noise or separate it from workers, administrative controls change workers’ activities and emphasize policies that can lower their exposure. Administrative controls are usually less expensive than engineering controls because there are no costs to replace or modify equipment. However, administrative controls usually are not as effective because they do not eliminate the source of the noise.

How to use administrative controls:

- Reduce the time workers spend in noisy areas; rotate two or more workers so that each is exposed to less noise for shorter periods of time.
- Ensure that workers know how to perform their tasks and operate equipment at safe noise levels.
- Use warning signs to identify work areas where noise exceeds safe levels.
- Maintain equipment so that it runs smoothly and quietly.
- Shut down noisy equipment when it is not needed for production.
- Consider how much noise that equipment will produce before purchasing or renting.

About hearing protectors

There are two types of hearing protectors: **earplugs** and **earmuffs**. They are the next line of defense against noise when you cannot reduce exposures with engineering or administrative controls.

- **Earplugs** fit in the outer ear canal. To be effective, they must totally block the ear canal with an airtight seal. They are available in different shapes and sizes and can be custom made. An earplug must be snugly fitted so that it seals the entire circumference of the ear canal. An improperly fitted, dirty, or worn-out plug will not seal and can irritate the ear canal.
- **Earmuffs** fit over the entire outer ear – they will not fit properly over glasses or long hair – and are held in place by an adjustable headband. The headband must hold the earmuff firmly around the ear.
- **Effectiveness:** Better earplugs and earmuffs are about equal in sound reduction, though earplugs are more effective for reducing low-frequency noise and earmuffs for reducing high-frequency noise. Using earplugs and earmuffs together increases protection against higher noise levels (above 105 decibels) than either used alone.
- **Selecting hearing protectors:** Focus on the three Cs: comfort, convenience, and compatibility. Employees will not wear hearing protectors that are uncomfortable, difficult to use, or interfere with their work. They

should be able to choose, with the help of a person trained in fitting hearing protectors, from among a variety of appropriate types and sizes.

Most hearing protectors are labeled with a noise reduction rating (NRR) indicating a protection level in decibels, shown below. However, these ratings are not reliable outside of a testing laboratory, which is where they received the rating. The NRR rating tends to overestimate the protection a hearing protector will provide under real-world conditions.



Common thoughts about hearing protectors



1. Roll plug



2. Pull ear



3. Push plug



4. Hold plug



BCA HCP POLICY

HEARING ATTENUATION USE - (Inspecting work near any power-actuated equipment)

1. Category 1: General Hearing Attenuation Policy
 - a. Referring to Appendix A (Tables 2, 3, 4) and Appendix C all inspectors may inspect without hearing attenuation PPE provided they are:
 - i. Standing no closer than 20 feet from the construction activity
 - ii. Not exceeding continuous observation for longer than 1 hour or,
 - iii. Exceeding a minimum exceeding 4 hours within the 8 hour day.
2. Category 2: Mandatory Hearing Attenuation Use Policy
 - a. Referring to Appendix A (Tables 2, 3, 4) and Appendix C all inspectors shall be required to use hearing attenuation PPE if;
 - i. Inspection requires continuous observation that exceeds 1 hour or,
 - ii. Exceeds more than 4 hours within the 8 hour day.
 - iii. All pile driving activities require mandatory continuous use of issued hearing attenuation for any duration that the inspector is within 100 feet from the operation.
 - b. At any location posted with a sign stating “HEARING PROTECTION REQUIRED BEYOND THIS POINT” or similar statement.

