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Eye on Safety

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Hearing conservation

OSHA expects employers to reduce employee exposures to hazardous noise levels through the use of feasible engineering and administrative controls. A hearing conservation program is required if these controls don't adequately reduce exposures.

OSHA's standard on occupational noise exposure is at 1910.95. Your company must have a hearing conservation program implemented when employees are exposed to 85 or more decibels (dB) averaged over an eight-hour period. The program includes noise monitoring, hearing tests, hearing protection devices (HPDs), recordkeeping, and an annual training program. A thorough training program can help keep employees from being overwhelmed by all of the provisions of the program.

The extent of noise exposure

Every year, about 30 million U.S. workers are exposed to hazardous noise. Noise-related hearing loss has been one of the most common workplace health problems for more than 25 years. In 2015, BLS reported 220 hearing loss cases.

The most obvious hazard from being exposed to excessive noise is that it can cause noise-induced hearing loss. Exposure to high levels of noise can cause permanent hearing loss.

Neither surgery nor hearing aids can help correct it. Short-term exposure to loud noise can cause a temporary change in hearing (your ears may feel stuffed up) or a ringing in your

ears (tinnitus). However, repeated exposures to loud noise can lead to permanent tinnitus and/or hearing loss.

In addition to hearing loss, excessive noise can:

- Cause you to miss hearing important warnings or instructions;
- Cause fatigue from the strain of talking and listening over the noise; and
- Cause increased blood pressure, headaches, sleeping disorders, and other ailments



Engineering controls

The most effective way to control noise is to eliminate it by using engineering controls. Generally, the term "engineering controls" means using materials and equipment.

Common examples of engineering controls are:

- Installing a muffler on a machine;
- Erecting acoustical enclosures and barriers around noisy equipment;
- Installing sound absorbing material on walls;
- Installing vibration mounts under equipment;
- Making sure moving parts on machinery are properly lubricated; and
- Buying quieter equipment.

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**National Institutes of Health
Office of Research Services
Division of Occupational
Health and Safety**

Providing a safe and healthy environment for employees, patients and visitors.

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Hearing conservation *(continued from page 1)*

Administrative and work practice controls

Implementing administrative controls involves managing how work is assigned.

Examples include operating a noisy machine only during a shift when fewer people are exposed, or moving an employee to a less noisy job once he has been exposed to a certain daily dose of noise.

Even providing quiet areas where employees can get relief from workplace noise is an example of an administrative control. Lunchrooms and break areas can be located away from noise.

Hearing conservation program requirements

When it isn't feasible to otherwise reduce noise to a safe level, the employer has to implement a hearing conservation program. A hearing conservation program is required for all employees whose noise exposure levels equal or exceed an 8-hour time-weighted average of 85 dB.

The hearing conservation program includes provisions for:

- Monitoring noise levels;
- Providing employees with audiometric testing;
- Using appropriate HPDs;
- Training; and
- Recordkeeping.

Noise monitoring

Noise monitoring is done for many reasons, including:

- To determine whether noise levels could contribute to hearing loss;
- To determine whether noise interferes with communication or warning signals;
- To identify employees for the hearing conservation program;
- To set priorities for noise control efforts;
- To identify areas where hearing protection practices are needed;
- To evaluate specific sources of noise; and
- To evaluate the success of noise control efforts.

Monitoring is conducted using sound level meters, dosimeters worn by employees, or other more sophisticated acoustical equipment. Employees must be able to observe the monitoring. Employees who are exposed at or above an 8-hour time-weighted average of 85 dB must be given the results of the monitoring.

Hearing tests

Employers have to provide affected employees with hearing tests in order to know if the hearing conservation program is effective.

A technician uses an instrument (an audiometer) to send sounds (tones) through headphones. The person being tested responds to the test sounds. The chart that records responses to the test sounds is called an audiogram. Employees can request test results.

You first have a baseline audiogram. This is followed up with annual audiograms. If tests show that you have experienced a certain change in the hearing threshold relative to the baseline audiogram, additional testing or examinations may be necessary, and you need to be refitted and retrained in the use of HPDs.

Use of HPDs

By wearing HPDs, you reduce the level of sound entering the ear. Three typical types of HPDs are:

- Earmuffs;
- Ear canal caps; and
- Earplugs.

HPDs must be available (at no cost) to any employee who is exposed at or above an 8-hour time-weighted average of 85 dB. Under certain conditions, employees can be required to wear the HPDs. You must be able to select HPDs from a variety of suitable choices. The HPDs must fit properly, and you must be trained to use and wear them correctly.

For example, to correctly insert foam earplugs, follow the manufacturer's instructions. In general:

1. Roll the earplug between your fingers so it is tightly compressed into a smooth, long, slender cylinder.
2. Reach over your head with the opposite hand and gently lift and pull your ear to straighten the ear canal.
3. While holding your ear, insert the compressed earplug with your other hand, and hold it in place with a finger while it expands into your ear.

Try this!

A simple exercise using HPDs can help you appreciate your sense of hearing. Wear earmuffs, canal caps, or earplugs sometime while you're relaxing at home. You'll quickly notice how difficult it is to enjoy conversations with your family and friends, watch your favorite television show, or listen to music. After a few minutes, you'll really be glad you can remove the HPDs and get back to normal. Remember this exercise whenever you're tempted to not wear your HPDs on the job.



Safety focus: Desktop ergonomics

Dry eyes, sore muscles, and fatigue are all symptoms of prolonged computer use. Sometimes ignoring the aches and pains can result in the development of chronic conditions such as:

- Carpal tunnel syndrome (injury to nerves in the wrist);
- Tendinitis (swelling of the tendons) in the wrist or elbow; or
- Tenosynovitis (swelling of the sheath around a tendon).

Often the solution is to fit the workstation to each worker's personal needs, paying close attention to posture.

Start with the work surface

The ideal work surface is adjustable in height with a separate adjustable keyboard and plenty of room for the legs underneath. It should have enough open space for workers to have ready access to the materials they use.

Workers shouldn't have to reach very far to use the phone. Wearing a headset eliminates the tendency to cradle the phone between the shoulder and the ear.

Have a seat

The ideal seat pan has a rounded, padded front that is about three inches from the front edge to the back of the lower leg at the knee when the back touches the backrest.



The angle of the seat pan should be adjustable. Workers should be able to adjust the height of the seat pan so that their feet rest flat on the floor. Their forearms should be horizontal and at right angles to their upper arms, and their elbows should just clear the top of the work surface.

The width of the backrest should not interfere with the worker's

arms. Most computer users tend to sit in an upright or slightly forward posture. The angle of the backrest should be adjusted so it touches the worker's back.

Armrests should be adjustable. Forearms should rest comfortably on the armrests, with the shoulders relaxed. If the armrests are too high, they will push the shoulders up and cause stiffness or pain in the shoulders and neck; if they're too low, they cause the worker to slump and lean to one side. Remove armrests if they can't be properly adjusted.

Key with ease

When using a keyboard, the wrists and forearms should be relatively straight, and the hands should be at or just below elbow height. Shoulders should be relaxed and elbows close to the body. It's important for the wrists to not bend up while keying.

The mouse or touchpad should be at the same level as, and adjacent to, the keyboard. The arm should remain close to the body. The hand, wrist, and forearm should be reasonably straight and slightly above the mouse. Workers should try to move the arm instead of bending the wrist when moving the mouse side to side.

See the screen

The top of the display should be at, or slightly below, eye level. The area of the screen that the worker looks at most often should be about 15 degrees below eye level. The screen should be about an arm's length from the eyes. Employees who wear bifocal or progressive lenses may want to place the display lower to avoid tilting the head back to hit the lenses' sweet spot.

Laptops and tablets

People tend to bend their heads forward when they use laptops, tablets, and cellphones. Over time, that posture can put them at risk for chronic neck and shoulder pain.

Cellphone users who write long blocks of text are also stressing their thumbs, fingers, and hands.

Use a standard-sized keyboard and mouse with the laptop or tablet for prolonged periods of use. Place the laptop on a platform or riser so that the display is at a comfortable height.

Stand up, sit down

A sit-stand workstation is a good fit if:

- Its components are easy to adjust;
- It has a height-adjustable work surface and an adjustable keyboard platform that will fit sitting and standing users;
- It has a display platform or arm that allows the top of the display to be set at the same height as the user's eyes; and
- It permits a keyboard and mouse to be at the same height, at or slightly below the elbows.



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How loud is too loud?

*"Hear one side
and you will
be in the dark.
Hear both and
all will be clear."*

By:
Lord Chesterfield,
British statesman
1694-1773



Protect your hearing.

Loud noise is the enemy of good hearing. From blaring music at a rock concert to the roar of a motorcycle engine or the whine of a leaf blower, noise can damage the inner ear and bring hearing loss that can't be corrected.

Both the intensity of noise and its duration damage hearing. It's possible to harm your hearing after two hours of exposure to a noisy leaf blower, or 15 minutes of thundering crowd noise at a football game.

A person might not notice significant damage immediately, but the impact of noise exposure adds up over a person's lifetime. Exposure on a regular basis increases the risk for permanent damage.

After leaving a noisy environment, your ears may feel stuffed up and sounds may be muffled. Your hearing may return to normal within a few hours or days, but if you're exposed to loud noise again and again, irreversible hearing loss can occur.

Did you know?

- Most people don't feel any warning signs until their hearing is damaged.
- A person can develop noise-induced hearing loss at any age.

- You could lose some hearing in less than a minute if you're near a fire truck or ambulance siren.
- If a firecracker explodes near your ear, you could lose all your hearing.

If you need to shout when the person you're speaking to is only a few feet away, it's too noisy. Use earplugs or move to a quieter area.

To measure the noise level, download a smartphone app that acts as a sound level meter. If the reading is 85 decibels or higher, you should only be exposed to the noise for a short time before heading to a quieter area.

Sound level	Example	Resulting damage
30 decibels	Whispering	These sounds typically don't damage hearing
45 decibels	Refrigerator humming	
60 decibels	Normal conversation	
70 decibels	Washing machine, dishwasher	You may feel annoyed by noises at this level
85 decibels	Heavy city traffic	
90 decibels	Gas-powered lawnmowers and leaf blowers	Damage possible after 2 hours
95 decibels	Motorcycles	Damage possible after about 50 minutes
100 decibels	Sporting events	Hearing loss possible after 15 minutes
105-110 decibels	Rock concert or nightclub	Hearing loss possible in less than 5 minutes
120 decibels	Siren	Pain and ear injury
140-150 decibels	Firecrackers	Pain and ear injury