

CAL / OSHA: PREVENTING HEARING LOSS FACT SHEET

LENGTH: 10 MINUTES

PROGRAM SYNOPSIS:

Hearing loss can have a devastating impact on our quality of life and the quality of life for our loved ones; however, controlling our exposure to high levels of noise can prevent the life-changing effects of hearing loss. This program provides an overview of California OSHA's Hearing Conservation Program Standard and explains how our hearing can be damaged by exposure to harmful noise. Viewers will also learn that hearing loss can be prevented by participating in the hearing conservation program and properly wearing hearing protection when required.

Topics include how the components of the ear process sound, permissible exposure limits, use of disposable and reusable ear plugs, advantages and disadvantages of earmuffs, audiometric testing and the importance of protecting our hearing.

PROGRAM OBJECTIVES:

After watching the program, the participant will be able to explain the following:

- How the components of the ear process sound;
- How to properly insert disposable ear plugs;
- What the advantages and disadvantages of earmuffs are;
- How the company's audiometric hearing program works;
- Why it is so important that we protect our hearing.

INSTRUCTIONAL CONTENT:

BACKGROUND

- Power tools, lawn equipment, metal working machinery, air compressors and countless other pieces of machinery or tools generate noise at levels high enough to damage our hearing. Once damaged, our hearing cannot be repaired. Hearing loss can have a devastating impact on our quality of life and the quality of life for our loved ones.
- To prevent hearing loss, companies with high noise levels are required by California OSHA to have a "Hearing Conservation Program." The five main elements of a hearing conservation program include noise monitoring, hearing tests, training, hearing protection devices and recordkeeping.
- For a hearing conservation program to be effective, all employees must understand how excessive noise can damage our hearing and the actions that must be taken to prevent hearing loss.

HOW THE COMPONENTS OF THE EAR PROCESS SOUNDS

- Our ability to hear depends on many delicate processes working correctly. Sound travels in waves and upon reaching our outer ear is channeled into our ear canal. Inside the ear canal, these sound waves strike the ear drum, which is covered with a delicate membrane. The membrane of the eardrum vibrates against three delicate bones which carry the vibrations to the inner ear and to a structure called the cochlea. The cochlea is filled with fluid and contains tiny hair-like structures called cilia.
- When the vibrations reach the cochlea, its fluid is set into motion. The cilia sway and bend as they are contacted by these waves of fluid. As they move, the cilia transmit signals to the brain which interprets these signals into the sounds we hear.
- The weak point in this delicate process is the cilia. When noise levels become harmful, the fluid waves inside the cochlea become so powerful that the cilia can be damaged. When cilia are damaged, hearing loss will occur. Damaged cilia do not repair themselves, and we cannot grow more. When our cilia are damaged, any resulting hearing loss is permanent.

PERMISSIBLE EXPOSURE LIMITS

- The hearing conservation program limits employee noise exposure to the permissible exposure levels listed in Cal/OSHA's Hearing Conservation Program Standard. These permissible exposure levels are a combination of decibels and time of exposure.
- For example, for an eight-hour exposure, the maximum permissible sound level is 90 decibels.
- Employers must conduct noise testing to periodically measure the level of noise to which workers are exposed.
- California OSHA also lists an action level of 85 decibels. This is the number upon which action must be taken to reduce the risk and exposure to employees.
- If possible, engineering or administrative controls will be used to reduce noise exposure. If this is not possible, employees will be required to use hearing protection.
- The purpose of this hearing protection is to reduce employee noise exposure to permissible levels.

NOISE REDUCTION LEVELS

- There are various types of hearing protection devices and each has a noise reduction rating. The noise reduction rating is a measure, in decibels, of how much the device reduces the level of outside noise before it reaches the inner ear.

- Hearing protection devices with higher noise reduction ratings offer more protection than those with lower ratings.
- If you are required to wear hearing protection, it will be provided to you by the company and you will be instructed how to use it properly.

EAR PLUGS

- One of the most common types of hearing protection is the ear plug.
- One advantage of ear plugs is that they are available in different sizes and can be disposable or reusable. Some ear plugs are designed to be inserted into the ear canal, while others only cover the entrance to the ear canal. This type of ear plug is called a canal cap.
- Most disposable ear plugs are made of polyurethane or other expandable foam, which is easily compressed for insertion into the ear.
- The most important thing to know about ear plugs is that they must be installed properly to achieve their full noise reduction rating. Improperly installed ear plugs offer very little protection.
- To properly install this type of disposable ear plug, first make sure your hands are clean. One disadvantage of ear plugs is that handling with unclean hands can allow dirt, germs and other foreign matter to enter our ear canal.
- Once your hands are clean, compress the ear plug by rolling it in your fingers. With your other hand, pull up on the top of the ear. This helps to open the entrance to the ear canal so the plug can be inserted.
- Insert the plug into the ear canal and hold it in place with the tip of your finger while the ear plug expands. The ear plug will expand to conform to the shape of your ear canal.
- Reusable ear plugs do not require compression. This type of ear plug is usually made of silicone, rubber or plastic. They must also be inserted properly into the ear canal to achieve maximum noise reduction.
- Reusable ear plugs should be cleaned with soap and warm water on a regular basis and stored in a clean, dry container when not in use.
- Ear plugs come in many shapes and sizes, so be sure you find one that fits properly and comfortably. Ask for help if you are unsure about the fit, comfort or proper installation of your ear plugs.

EARMUFFS

- Earmuffs are also a popular choice when it comes to hearing protection.
- Earmuffs are designed to cover the entire ear and consist of a pair of cups connected by a headband. These cups are usually filled with soft foam to provide a comfortable, secure fit and low-pressure seal.
- Some advantages of earmuffs are that one size fits all, they are easy to put on and take off, and it is easy to visually verify they are being worn by employees. Also, with proper cleaning, earmuffs may be shared with other employees.
- Some disadvantages to earmuffs are some employees may find the tight fit uncomfortable, they may cause sweating in hot environments and they may interfere with other protective equipment.
- In extremely loud environments it may be necessary to wear both ear plugs and earmuffs to achieve the noise reduction required to reduce exposure to permissible levels.

AUDIOMETRIC TESTING

- A Hearing Conservation Program includes audiometric testing. Audiometric testing is a program of hearing tests and evaluations by hearing professionals. These tests provide an initial hearing baseline for each employee so subsequent testing can reveal any indications of hearing loss.
- Employees enrolled in the hearing conservation program will have their hearing tested once a year. An employee's initial test, known as a baseline audiogram, will establish a baseline to which future tests can be compared.
- If subsequent tests show hearing loss of at least 10 decibels as compared to the baseline audiogram, the employee has suffered some hearing loss. Hearing loss of 10 decibels is referred to as a "Standard Threshold Shift."
- When an employee's hearing test indicates that hearing loss has occurred, the employee's exposure to noise will be re-evaluated. This may include retraining the employee to ensure hearing protection is being used properly or introducing administrative controls to reduce the amount of time the employee is exposed to high noise levels.

IMPORTANCE OF PROTECTING OUR HEARING

- All workers should be on the lookout for any symptoms of hearing loss so preventive measures can be taken.
- People with hearing loss can often hear but not understand what others are saying, especially in the presence of background noise or other conversations.
- Other symptoms include increasing the volume of your television or radio to levels uncomfortable for others and having trouble hearing voices in the higher frequency ranges.
- If you suspect you are experiencing hearing loss, you must be extra vigilant to protect what hearing you have left.
- In addition to protecting our hearing at work, it's equally important to protect our hearing off the job. After all, harmful noise is damaging no matter where it occurs.

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ANSWERS TO THE REVIEW QUIZ

1. c

2. a

3. a

4. b

5. b

6. d

7. a

8. a

9. b

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REVIEW QUIZ

The following questions are provided to determine how well you understand the information presented in this program.

Name _____ Date _____

1. The cochlea is filled with _____ and is shaped like a coiled tube.
 - a. Blood
 - b. Air
 - c. Fluid

2. Damaged cilia in the ear do not repair themselves and we cannot grow more.
 - a. True
 - b. False

3. Cal/OSHA's Hearing Conservation Program standard limits the maximum permissible sound level for an 8-hour exposure at _____ decibels.
 - a. 90
 - b. 97
 - c. 105

4. Hearing protection devices with higher noise reduction ratings offer less protection than those with lower ratings.
 - a. True
 - b. False

5. _____ ear plugs do not require compression when you insert them into your ear.
 - a. Disposable
 - b. Reusable

6. Which of the following is a disadvantage of wearing earmuffs?
 - a. They may be uncomfortable
 - b. They may cause sweating in hot environments
 - c. They may interfere with other protective equipment
 - d. All of the above

7. In extremely noisy environments, you may be required to wear both ear plugs and earmuffs.
 - a. True
 - b. False

8. Employees enrolled in the hearing conservation program will have their hearing tested once a year.
 - a. True
 - b. False

9. A standard threshold shift has occurred when a hearing test indicates hearing loss of 5 decibels when compared to an employee's baseline audiogram.
 - a. True
 - b. False