

## **MAJOR PROGRAM POINTS**

# **"HEARING CONSERVATION AND SAFETY... A REFRESHER PROGRAM"**

**Training for the  
OSHA OCCUPATIONAL NOISE EXPOSURE  
STANDARD**

# **OUTLINE OF MAJOR PROGRAM POINTS**

The following outline summarizes the major points of information presented in the program. The outline can be used to review the program before conducting a classroom session, as well as in preparing to lead a class discussion about the program.

- **We live in a noisy world.**
  - The sound that surrounds us can often help us to communicate with our environment.
  - But it can hurt us as well, often without our even realizing it.
  
- **For about 10 million people, hearing loss resulting from loud noise is a grim reality. Noise can also cause:**
  - Stress.
  - Fatigue.
  - Interference with concentration.
  - Lower morale.
  - Accidents.
  
- **That's why OSHA (the Occupational Safety and Health Administration) created a regulation to protect workers from high levels of noise.**
  - It's called the "Occupational Noise Exposure Standard."
  - The regulation requires employees to be trained regarding how to protect their hearing when they work in areas where sound levels can be harmful.
  - That's what this program is all about.
  
- **Noise has often been called any unwanted sound, but harmful noise is much more than that.**
  - The physical pressure created by high levels of sound can have a powerful effect on your body and your mind.
  - While noise has many different characteristics, there are three that can be dangerous.

- **The first is known as "frequency."**
  - The notes produced by a piano change as each new key is struck.
  - This is because the vibrations sent out by the individual strings are different.
  - These waves can be measured in cycles per second, or "hertz."
  - The higher the number of cycles per second a sound has, the higher the "frequency" of the sound.
- **The frequency of a noise is a concern because higher frequencies are more damaging to our hearing.**
- **The second source of potential trouble for your hearing is a sound's volume.**
  - Sound volume is measured on a mathematical scale of units known as decibels, or "dBs."
  - Each of these increments represents a significant increase in the power of a noise.
  - For example, a three dB increase is a doubling of sound energy.
  - Because volume multiplies as it rises up the scale, a 10 decibel gain represents a 10-fold increase in power.
- **The third potentially harmful characteristic of sound is the length of time you remain within a noisy area.**
- **This duration of sound is defined by three categories.**
  - "Continuous" noise is a steady sound with little or no change over time.
- **Home construction sites will often have a lot of "intermittent" noise.**
  - In these situations, loud noises can occur for significant time spans, but are separated by relatively quiet pauses.

- **"Impulsive" noise lasts for less than a second, but is generally very loud.**
- **Noise that is loud and continuous is especially dangerous to your hearing.**
  - It is when the loudness level reaches an average of 90 decibels over an eight-hour time frame that your hearing is in jeopardy.
  - That's when OSHA's noise exposure regulation says you must take steps to protect your ability to hear.
- **The ear is a delicate but remarkably efficient amplifier.**
  - In fact, even modern electronics are no match for the human ear.
- **The "outer ear" collects sound waves as they come into the immediate area.**
  - These are then funneled down the ear canal toward a tight membrane called the eardrum.
- **When the sound waves strike the eardrum, it vibrates.**
  - These vibrations are then transmitted to the middle ear.
- **Three small bones within the middle ear amplify the power of the sound to about 1000 times that of the original sound wave.**
  - This intensified sound vibration is then transmitted to the fluid-filled inner ear (the cochlea).
  - As this happens, it stirs thousands of hairs within the cochlea.
  - Finally, the movement of these hairs sends electrical signals to the brain, which interprets them as "sound."
- **Hearing loss most often occurs when the hairs within the cochlea are harmed.**
  - Loud noise can easily injure these fragile hairs and their associated nerve cells.
- **Once harm is done to your cochlea, there is no medical treatment that can bring your hearing back.**
  - This makes it especially important to protect yourself.

- **Most of us don't realize how much noise there is in our lives.**
  - At work, the legal limit for noise is an average of 90 decibels over an eight-hour period.
- **Many facilities use a "system of controls" to protect workers from this noise.**
  - Often, the first thing that is done is to limit the amount of time an employee spends in a noisy area.
  - At other times, it's possible to use sound muffling equipment on the source of the noise.
  - When neither of these work, hearing protection is what is used.
  - There are a variety of hearing protection devices available for just about every situation.
- **Hearing protection is designed to reduce the sound that reaches your ears.**
  - This ability is expressed as the "noise reduction rating" (NRR).
  - This number helps to indicate how well the device can reduce noise.
  - But it's important to realize that these ratings may not be accurate for your work environment.
- **During testing, the device's manufacturer assigns an NRR based upon a "best-case" scenario.**
  - Since this rarely, if ever, matches the conditions found in a workplace, OSHA recommends that the NRR be reduced by half when you are determining what type of protection you should use.
- **To calculate the amount of protection you need:**
  - First ask your supervisor what the noise level is in your area.
  - Next, subtract 90 decibels from the figure they give you.
  - Multiply the resulting number by two.
  - That number is the minimum noise reduction rating your hearing protection device should have.

- **Once you know how much noise reduction you need, you also have to choose the type of protection that is best for your working conditions.**
  - Adequate protection is the first selection concern.
  - Proper fit is important too.
- **You need to choose a protector that is practical, as well.**
  - It should not interfere with doing your job.
  - Otherwise, you may be tempted to remove it.
- **As you consider your choice of equipment, keep these three words in mind:**
  - Protection.
  - Fit.
  - Practicality.
- **Earmuffs are used in a number of situations.**
  - "Cap-mounted" earmuffs attach to safety helmets.
- **Earmuffs are popular because:**
  - They are easy to use.
  - They are designed to fit anyone.
  - They aren't easily lost or misplaced.
  - They don't irritate infections or other ear conditions.
  - They can be worn with ear plugs if additional protection is needed.
- **Muffs can't be worn in all situations, however. Some of their disadvantages include:**
  - They are heavier than other types of protection.
  - In hot working conditions, they can be very uncomfortable.
- **A muff's protection can also be reduced if it doesn't "seal" well to your head, which can be caused by:**
  - Glasses.
  - Facial hair.
  - Other personal protective equipment, such as respirators.
- **Also, because muffs can be bulky, they can make working in confined spaces difficult.**

- **If you decide to use earmuffs, you need to follow some basic guidelines to ensure top performance:**
  - Place the cups over your ears, and make sure that the cuffs provide a secure seal with your head.
  - The headband should be tight enough to provide a proper seal, but not so tight that it becomes uncomfortable.
  
- **It is also important to follow all of the manufacturer's instructions for care of your muffs.**
  - Inspect your muffs regularly for wear and tear.
  - Don't use them if they are defective in any way.
  - Wash the cups and headband with a mild detergent.
  
- **Keep ear cushions clean by using a soft brush to remove oil and dirt that can harden the cushioning material.**
  - Replace the cushions when they get stiff or brittle.
  
- **If earmuffs aren't right for your situation, ear plugs might be a good alternative.**
  - These are designed to fit inside the ear canal, and come in both reusable and disposable models.
  
- **There are a number of good reasons to use plugs:**
  - They are small and lightweight.
  - They're inexpensive and easily replaced if lost.
  - In hot or humid conditions, they can be more comfortable than other types of protection.
  - They don't interfere with other personal protective equipment.
  
- **But just like all hearing protection, plugs are not ideal in every instance... they have disadvantages too. For instance:**
  - Each of us is different, and for some people, plugs may irritate the ear canal.
  - Plugs are easily lost, so you may need to carry extra pairs with you.
  - They don't provide adequate protection for high levels of noise.

- **Putting plugs in can be a problem too:**
  - Washing your hands prior to inserting plugs can be difficult if your work area doesn't have water readily available.
  - Both inserting and removing plugs can be hard for some people as well.
  
- **If you do prefer earplugs for your protection, be sure to take these steps to get their full benefit:**
  - Always wash your hands before handling plugs.
  - When using foam-type plugs, first shape them between your thumb and forefinger for easy insertion.
  - When your plugs are ready, use your "opposite" hand to pull the ear outward and upward.
  - Then, insert the plug.
  - Release your ear and make sure that the plug is fully inserted, so it will not fall out.
  
- **Caring for your plugs is just as easy as using them.**
  - The only "care" required for disposable plugs is that you throw them away.
  - Never use disposable plugs more than once.
  
- **Regularly inspect reusable plugs for torn flanges or other signs of wear.**
  - Don't use plugs that are weakened, because they won't protect you well.
  
- **Keep reusable plugs clean to avoid infection and to ensure a proper fit.**
  - Wash them with a toothbrush in a mild detergent.
  - Rinse the detergent off, then allow the plugs to air-dry on a clean surface.
  - Once they are completely dry, store them in their own plastic container.
  
- **Ear plugs work well in a variety of situations, but in locations where noise levels are intermittent, they can be bothersome.**
  - For these circumstances, canal caps may be more useful.

- **Canal caps, sometimes called pods, consist of two ear plugs held in place by a rigid band.**
  - As a result, they are easy to remove when sound levels decrease.
  - The thing to remember about canal caps is that they offer less protection than either muffs or individual plugs.
  - Ask your supervisor if this type of protection is suitable for your work area.
- **Even if you have taken every precaution, your employer will want to make sure your hearing is healthy, so be prepared to take hearing tests.**
  - Hearing tests provide an accurate measure of your hearing ability.
  - They also make it possible to start early medical treatment, if a test shows a hearing loss.
- **The first test establishes a starting point, or baseline, of your hearing levels.**
  - Remember, the goal of OSHA's Noise Exposure Standard is to preserve your ability to hear human speech.
  - Since the human voice is made up of many frequencies of sound, a hearing test is designed to measure your ability to hear at the 500, 1000, 2000, 3000, 4000 and 6000 hertz frequencies.
- **The results of your hearing test are plotted on a graph called an audiogram.**
  - This is your hearing record.
- **If a 10 decibel reduction in your ability to hear is detected at either the 2000, 3000 or 4000 hertz frequencies, you will be notified.**
  - This kind of hearing change is known as a "standard threshold shift."
  - It means that a sound has to be 10 decibels louder for you to hear it than was necessary in previous years.

- **If test shows that you have experienced this kind of hearing loss, you may be asked to take the test again.**
  - This is to make sure the first test was accurate, or that the change was not a temporary one (temporary hearing loss can be common).
- **The hearing loss could also be the result of an ear infection or some other reason.**
  - To rule these out, you may be referred to another physician for a medical exam.

**\*\*\*SUMMARY\*\*\***

- **The real test of any hearing conservation program is that it works. Remember these key points to keep your hearing in top condition.**
- **Noise can damage hearing when it averages 90 decibels or more for an eight-hour time period. Be particularly aware of:**
  - High frequency sound.
  - Loud sound.
  - The duration, or length of time, you are exposed to harmful sound.
- **Worn properly, hearing protection blocks noise from reaching your ears. When choosing protective equipment, consider its:**
  - Noise reduction rating.
  - Comfort and fit.
  - Practicality in your work environment.
- **Hearing tests are a valuable tool in your fight to maintain your ability to hear... so make sure to have them regularly.**
- **Your life would not be the same without the ability to hear.**
  - Our hearing allows us to communicate with others, warns us about dangerous situations and makes it possible to enjoy simple pleasures like music.
- **Hearing is irreplaceable. Do everything you can to preserve this precious gift... before it is too late!**