PPE – Hearing Quiz

QUESTION

What are three components to control unacceptable noise in the workplace’

ANSWER

The three components are:

1. At source, measures are aimed at reducing or eliminating the noise being generated.
2. Along the path, barriers can be introduced to reduce the amount of noise reaching the worker.
3. At the worker, measures involve personal protective equipment being properly selected, fitted, and won.

WHY IS IT RIGHT

HEARING LOSS

- Any reduction in the normal ability to hear is referred to as a loss of hearing. **A hearing loss can be either temporary or permanent.**
- Other prime causes of permanent hearing loss are age, traumatic injuries (such as from explosions or gunfire), and infection. Noise, however, is the major identifiable cause of hearing loss.
- Though disturbing ears become accustomed to noise and the brain accepts it as normal, after a short while. Do not be fooled though, noise-induced hearing loss cannot be reversed!
- Loss of hearing from high noise makes it hard to hear warnings and directions and this can lead to accidents. Though most employers make great effort to protect workers from noise hazards, sometimes, the problem is not what is done but how it is done.
- Some workplaces might not understand what level of noise is harmful and this creates room for error while implementing controls. But safety regulations require employers to protect workers from excessive noise; this means, having a program that regulates noise exposure through noise level assessments, hearing protection, employee training and hearing tests.
- Most damage due to noise is gradual and over time. Because of this, many people ignore or do not realize that their hearing is being damaged.

Damage can also occur from a single loud impulse noise such as a gunshot or explosion. These types of noises can rupture the eardrum or damage the bones in the middle ear. This kind of NIHL can be immediate and permanent. Loud noise exposure can also cause tinnitus’a ringing, buzzing, or roaring in the ears or head. Tinnitus may subside over time, but can sometimes continue constantly or occasionally throughout a person’s life. Hearing loss and tinnitus can occur in one or both ears. Sometimes temporary hearing loss can subside however the event that caused it can still cause long term damage to your hearing.

HEARING PROTECTION IN THE WORKPLACE

When does hearing loss, or hearing impairment, become the result of a work-related exposure’

Tools that are used in our lines of work create loud noise, too, but that doesn’t necessarily mean that employees will lose their hearing. With the proper workplace hearing protection controls in place to eliminate, reduce, and protect against potentially damaging noise exposures, we reduce the chances that our employees will experience occupational hearing loss.

UNDERSTANDING HEARING DAMAGE

Hearing loss can occur when exposed to 85 decibels of noise averaged over 8 hours. Normal conversations typically occur at 60 decibels, well below the hearing loss threshold. For every 3 decibel increase past 85 decibels, hearing loss can occur in half the amount of time. So it only takes 4 hours of exposure to 88 decibels for hearing loss to occur, and 2 hours of exposure to 91 decibels. Once noise levels exceed 100 decibels, a person can suffer hearing damage in as little as 15 minutes. The louder the noise, the faster hearing loss occurs.

NOISE LEVELS IN THE WORKPLACE

- Air compressors from 3 feet away register 92 decibels, which would take less than 2 hours to cause hearing loss
- Powered drills register 98 decibels, which would cause damage after 30 minutes
- Typical factories often register at 100 decibels ‘ that’s 15 minutes of exposure
- Powered saws can reach 110 decibels from 3 feet away, which could cause permanent hearing loss in under 2 minutes

CONDUCT NOISE MONITORING

In short, if workers are exposed to these noise levels without protection, then hearing loss is very likely. The only way to know the exact noise levels that workers are exposed to is to conduct noise monitoring using specialized equipment, though this is only required when exposures are at or above 85 decibels.

PROTECTION IN THE WORKPLACE

The best protection work to eliminate the hazard, by eliminating the need to work with the tools or in the environments that create these noise exposures. Realistically, though, this isn’t always possible. Work to reduce the noise

levels that employees are exposed to. Some tools and machines are available that are designed to operate at lower decibels, therefore reducing the risk of hearing loss. We can also implement **Administrative Controls,** such as placing a cap on the number of hours that an employee can work in a high decibel environment, or limit the hours working with specific tools and equipment.

The final line of protection is PPE that meets OSHA hearing protection requirements. **Ear plugs and ear muffs** can reduce the decibel exposures, providing protection against hearing loss. Ear plugs provide the greatest amount of protection as long as they are inserted correctly. Therefore, employees need to be trained to wear them correctly when they are used. Ear muffs can also reduce the decibel exposures, though not to the extent that ear plugs can. They are easier to wear correctly, though, which is why some workers prefer them.

PREVENTION METHODS

The surest methods of preventing noise-induce hearing loss (NIHL) is to eliminate the source, or to reduce noise at the source by engineering methods. However, in certain situations, these measures are not possible. In such workplaces, workers may need to wear hearing protectors to reduce the amount of noise reaching the ears.

SELECTING HEARING PROTECTION DEVICES

People should wear a hearing protector if the noise or sound level at the workplace exceeds 85 decibels (A-weighted) or dBA. Hearing protectors reduce the noise exposure level and the risk of hearing loss.

If hearing protection is required, then a complete hearing conservation program should be implemented. A hearing conservation program includes noise assessment, hearing protector selection, employee training and education, audiometric testing, maintenance, inspection, record keeping, and program evaluation.

The effectiveness of hearing protection is reduced greatly if the hearing protectors do not fit properly, if they are worn only periodically, or if they are removed even for a short period of time. To maintain their effectiveness, the hearing protection should not be modified. Radio/music earphones or headsets are not substitutes for hearing protectors and should not be worn where hearing protectors are required to protect against exposure to noise.

Select hearing protection that is:

- Correct for the job.
- Provides adequate protection. Check the manufacturer’s literature.
- Compatible with other required personal protective equipment, or communication devices.
- Comfortable enough to be accepted and worn.
- Appropriate for the temperature and humidity in the workplace.
- Able to provide adequate communication and audibility needs (e.g., the ability to hear alarms or warning sounds).

WHY IS EVERYTHING ELSE WRONG

The best way to prevent hearing damage is by avoiding exposure to excessive noise. Noisy jobs should be identified, and control measures put in place.

Control measures might include:

- Installing sound-dampening or sound-proofing materials.
- Enclosing a noisy process or equipment.
- Regular maintenance.
- Job rotation ‘ to lessen exposure time.
- Putting up signage to warn workers hearing protection is required.

Workers can prevent hearing loss by:

- Staying informed and watching for warning signs, such as ringing or humming in your ears and temporary loss of hearing when you leave work.
- Wearing and maintaining all hearing protection provided by your employer.
- Using the right hearing protection for the job, task, or area.
- Participating in your employer’s audiometric program and understanding the results of your hearing tests.
- Asking questions about noise levels, hearing protection, and other noise and hearing related issues, as soon as you have a concern.

Hearing Protection Devices

Hearing protection devices (HPDs) should only be provided when engineering and administrative controls to reduce noise at the source or along the path cannot be implemented or while such controls are being put in place. HPDs are barriers that reduce the amount of noise reaching the sensitive inner ear. Fit, comfort, and sound reduction or “attenuation” are important considerations in choosing HPDs. The types of HPDs used most commonly are earplugs or earmuffs. Earplugs attenuate noise by plugging the ear canal. Earmuffs cover the external part of the ear, providing an “acoustical seal’.

Effectiveness

The effectiveness of HPDs depend on the amount of time they are worn. What is not obvious to most wearers is that the effectiveness of HPDs can be reduced by as much as 95% or more if the protectors are not worn for as little as three or four minutes in noisy environments. It is therefore important to wear HPDs during the entire period of exposure in order to achieve the maximum protection available.

Comfort

Comfort is an important consideration in selection. An HPD that isn’t comfortable will simply not be worn or will be worn improperly. With earplugs, several factors affect comfort. Since some plugs are relatively non-porous, they can often create a pressure buildup within the ear and cause discomfort. Dirty plugs may irritate the ear canal. Because of the shape of an individual’s ear canals, certain plugs may not fit properly. Earmuffs should be made of materials that do not absorb sweat and that are easy to maintain and clean. The earmuff cup should be adjustable to conform to various head sizes and shapes. Headband tension and earcup pressure should be adjusted so that they are effective without being uncomfortable. Weight may also be a factor.

Work Environment/Procedures

HPD selection is sometimes dictated by the constraints of the work area or work

procedures. For example, large volume earmuffs may not be practical in confined work situations with little head room or clearance. In that case, flat-cup muffs or earplugs may be more practical. Where work is necessary near electrical hazards, it may be desirable to use non-conductive suspension type muffs. The choice of protector may also be affected by the nature of work, as in welding where certain types of earmuffs may interfere with the welder's helmet. The attenuation of the muff-type hearing protector may be considerably reduced when worn with spectacle-type safety glasses. (The head configuration of the wearer and the type of glasses worn will determine the reduction in attenuation.)

Where safety glasses must be worn, cable-type temples should be used in order to allow the smallest possible opening between the seal of the protector and the head. Otherwise earplugs should be worn, provided they are adequate.

Consideration should be given to hearing protectors that can be attached to hard hats where exposures to noise may be high but intermittent and where hard hats must be worn at all times. Periodic adjustments may be necessary because movement of the hard hat may break the seal of the HPD.

Consideration should also be given to work involving oils, grease, and other products that may soil hands. Ear infections may occur when earplugs are inserted by dirty hands.

Overprotection

Workers wearing HPDs that provide too much attenuation may feel isolated from their surroundings. Sounds may be heard as muffled. Speech or warning sounds may be unrecognizable. Overprotection can lead workers to resist wearing HPDs. Protectors should be chosen to provide sufficient, but not excessive, attenuation.

Where communication is critical and hearing protection is required, communication headsets can be considered. These devices provide protection against harmful levels of noise, yet allow for important communication to be heard.

Fit, Care, and Use

An employer who provides a worker with an HPD must provide adequate training and instruction to the worker in the care and use of the device.

HEARING DAMAGE PREVENTION OVERVIEW

- The best way to protect yourself is to eliminate the exposure to the noise. That can be achieved through removing yourself from the area the noise is in or eliminating the excessive noise altogether.
- Engineering controls are the second-best choice in protection from noise. Sound barriers, enclosures, and noise dampening systems are examples of engineering controls that will bring down the level of noise in an area.
- Administrative controls such as training on using hearing protection, job rotation, breaks, and routine maintenance programs are some ways that protect workers from being exposed to hazardous noise.
- PPE is the last line of defense. It is important to know the levels of noise that remain after applying the other techniques mentioned above. For noises between 85 decibels and 100 decibels on an 8 hour TWA, ear plugs

will be enough to protect you if worn correctly. Over 100 decibels then double hearing protection is needed, an example is earplugs and ear muffs.

SUMMARY

Control of noise in workplaces is of growing importance as a result of increasing hearing loss claims.

This is a convenient way of understanding the overall problem and a useful approach for putting control measures in place. The three components can usually be treated in isolation, although sometimes all three must be considered together in order to control unacceptable noise levels.

1. **At the source, measures are aimed at reducing or eliminating the noise being generated.**
1. **Along the path, barriers can be introduced to reduce the amount of noise reaching the worker.**
1. **At the worker, measures involve personal protective equipment being properly selected, fitted, and worn. This PPE must be used in high noise environments all the time.**

TAKEAWAY

Once you damage your hearing, you cannot get it back. While hearing aids have advanced greatly, they still cannot replace your hearing to peak levels that it was at before the damage occurred. Understand the levels of noise you are exposed to and protect yourself from hearing loss.