Hearing Loss

INCIDENT

The Helena Police Department in Montana reached a $100,000 settlement with **a Helena teacher who suffered hearing damage during an active shooter drill**, and has since changed its training equipment to limit noise.

Lynn Trenary's lawsuit against the city was formally dismissed following the settlement. The city confirmed that it has revised its active shooter exercises to use quieter Airsoft firearms and training to not fire close to participants.

Trenary participated in active shooter training on June 10, 2016, at the Project for Alternative Learning in Helena. The exercise was intended to train teachers how to respond to a school shooting.

Trenary was 20 feet away from an officer shooting blank ammunition as part of the drill. She believed the officer was giving instructions and was trying to understand what he was saying when he fired, the lawsuit says.

Trenary experienced hearing loss and a permanent ringing in her ears called tinnitus. She was not given hearing protection or warned that shots would be fired near her and her husband. Hearing protection was later provided at her request.

The lawsuit alleged negligence on the part of the city for failing to provide hearing protection or warn participants and failing to properly train employees to safely conduct the exercise.

In response to the lawsuit, **attorneys for the city of Helena acknowledge** that a Helena police officer fired the blanks, but said Trenary was warned to cover her ears with her hands before the shots were fired. The city contended in court filings that the Helena Police Department was not negligent and had followed procedures and standards of care. The city also stated that it was possible Trenary's hearing loss could have come from a prior

incident.

Trenary's attorney issued a statement in response.

"The two blank gunshots fired from the policeman's pistol at the active shooter training caused serious permanent tinnitus and hearing loss. This has caused difficult communication problems for Lynn at work, home and socially," he said. "Lynn's family and friends are very aware of the new problems which her doctors said were directly caused by the gunshots being fired too close to her from a revolver.

"The city now uses 'airsoft' guns and bullets which when fired don't have the explosive danger of the blank bullets fired from a revolver. This change and the added care to not fire guns in close proximity to participants were positive results of this lawsuit."

The city continues to conduct active shooter exercises following the settlement.

"Active shooter trainings simulate real scenarios to help prepare individuals for the worst," public information officer Rebecca Connors said in a statement. "The city has adapted the program to both accommodate the safety of attendees while balancing the realism of the training."

NEED TO KNOW

Health Effects

Exposure to loud noise kills the nerve endings in our inner ear. More exposure will result in more dead nerve endings. The result is permanent hearing loss that cannot be corrected through surgery or with medicine. Noise-induced hearing loss limits your ability to hear high frequency sounds and understand speech, which seriously impairs your ability to communicate. Hearing aids may help, but they do not restore your hearing to normal.

HEARING LOSS OCCURS

Hearing loss occurs when workers are exposed to high levels of noise, whether suddenly or on an ongoing basis. Sadly, this type

of hearing loss cannot be corrected medically – neither surgery nor hearing aids are effective if hearing has been significantly damaged by hazardous noise. In some cases, the hearing loss is temporary. After leaving work, you may notice a reduced ability to hear, which returns after a few minutes or several hours. Unfortunately, constant exposure will eventually lead to permanent tinnitus (ringing in the ears) or permanent, significant hearing loss. The temporary hearing loss is merely the first stage of permanent damage.

SIGNS OF WORK-RELATED HEARING LOSS

The signs of a worker's exposure to dangerous, potentially permanently damaging noise levels include the following symptoms:

- Ringing in the ears (tinnitus)
- Buzzing sound in ears
- Roaring sound in head or ears
- Difficulty hearing the words of a person close to you at normal volume
- Indistinct sounds at higher ranges

Workers can experience these symptoms after leaving the place of employment, and as the hours pass, the effect reduces and regular hearing appears to be restored. In fact, if you are experiencing any of these symptoms, you may be in the early stages of permanent hearing loss.

Hearing Loss in the Manufacturing Industry

For workers in the manufacturing industry, hearing loss is the most commonly recorded occupational injury. Between compressed air, which is an estimated 92 dB, and loud machinery like grinders, drills and milling machines, which typically hit dB levels 95 and above, it's important for employers to take extra care to protect workers' hearing.

Hearing Loss in the Construction, Carpentry and Mining Industries

Loud power tools also make workers in construction, carpentry and mining industries particularly susceptible to hearing loss. In

fact, some tools, like a jackhammer, can reach up to 130 dB—more than 45 dB above the recommended limit. When exposed to these sounds for extended periods of time during a shift, the risk of hearing damage increases.

Likewise, miners are regularly exposed to sounds related to drilling into rock in a confined work environment, and as a result most miners have some form of hearing loss by the time they retire, according to the CDC.

Other industries most commonly affected by hearing loss include entertainment and nightlife, military, agriculture and farming.

WORKPLACE RISKS ASSOCIATED WITH HEARING LOSS

Hearing is the body's built-in alarm system and plays a vital role in protecting a person from physical harm. Hearing picks up on possible dangers that may not be visible yet, like the sound of an approaching truck or the clanging of a broken machine. However, when hearing is compromised, the built-in alarm system isn't as effective and may not pick up on incoming dangers as quickly, putting workers at risk.

Workplace accidents are common among workers with hearing damage due to reduced situational awareness or the inability to hear a warning siren or signal.

The risks associated with hearing loss don't stop there. Not only does hearing loss contribute to workplace-related issues, it can also take a toll on an employee's quality of life. Hearing loss is permanent, and as it worsens, it can make interpersonal communication difficult and frustrating, putting a strain on relationships. In addition, ringing in the ears associated with hearing loss can be disruptive to normal sleep patterns and concentration, which sometimes can increase the risk of depression, anxiety and stress. All of these factors may contribute to underperformance or dissatisfaction at work.

BUSINESS/REGULATION

OSHA requires employers to implement a hearing conservation

program when noise exposure is at or above 85 decibels averaged over 8 working hours, or an 8-hour time-weighted average (TWA). Hearing conservation programs strive to prevent initial occupational hearing loss, preserve and protect remaining hearing, and equip workers with the knowledge and hearing protection devices necessary to safeguard themselves.

Under **OSHA's Noise Standard**, the employer must reduce noise exposure through engineering controls, administrative controls, or Hearing Protection Devices (HPDs) to attenuate the occupational noise received by the employee's ears to within levels specified in Table G-16 and Table G-16A of 29 CFR 1910.95(b)(1).

Know Your Workplace Noise Levels!

If you need to raise your voice to speak to someone 3 feet away, noise levels might be over 85 decibels. Several sound-measuring instruments are available to measure the noise levels in a workspace. These include sound level meters, noise dosimeters, and octave band analyzers.

Noise may be a problem in your workplace if you:

- Hear ringing or humming in your ears when you leave work.
- Have to shout to be heard by a coworker an arm's length away.
- Experience temporary hearing loss when leaving work.

STATISTICS

- The Center for Disease Control (CDC) estimates that 22 million workers are exposed to potentially damaging noise at work each year. Whether you work at a sports venue, on a tarmac, or operate a jackhammer—hearing loss is preventable.
- Some of the most prevalent workplace hazards aren't seen—they're heard. The National Institute for Occupational Safety and Health (NIOSH) reports that 22 million U.S. workers are exposed to damaging noise levels at work, and according to the Centers for Disease Control and Prevention (CDC), workplace-related hearing loss is the most commonly reported injury.

- It’s not surprising, then, that hearing loss disability accounts for an estimated $242 million in workers’ compensation payments each year, according to the Department of Labor.
- Approximately 48 million Americans have some degree of hearing loss, according to the Hearing Loss Association of America. The National Institutes of Health estimates that 15% of those aged 20 to 65 are living with some level of noise-induced hearing loss.
- Noises over 85 decibels (dB) warrant the use of protection. For reference, normal talking is 60 dB, city traffic is 85 dB and a rock concert or a tractor is about 100-115 dB. Without proper protection, prolonged noise exposure in a factory setting can compound the hearing loss incurred from every day noises.

PREVENTION

Steps to reduce the hazard from noise

Noise controls are the first line of defense against excessive noise exposure. The use of these controls should aim to reduce the hazardous exposure to the point where the risk to hearing is eliminated or minimized. With the reduction of even a few decibels, the hazard to hearing is reduced, communication is improved, and noise-related annoyance is reduced. There are several ways to control and reduce worker exposure to noise in a workplace.

Engineering controls that reduce sound exposure levels are available and technologically feasible for most noise sources. Engineering controls involve modifying or replacing equipment, or making related physical changes at the noise source or along the transmission path to reduce the noise level at the worker’s ear. In some instances the application of a relatively simple engineering noise control solution reduces the noise hazard to the extent that further requirements of the OSHA Noise standard (e.g., audiometric testing (hearing tests), hearing conservation program, provision of hearing protectors, etc…) are not necessary. Examples

of inexpensive, effective engineering controls include some of the following:

- Choose low-noise tools and machinery (e.g., Buy Quiet Roadmap (NASA)).
- Maintain and lubricate machinery and equipment (e.g., oil bearings).
- Place a barrier between the noise source and employee (e.g., sound walls or curtains).
- Enclose or isolate the noise source.

Administrative controls are changes in the workplace that reduce or eliminate the worker exposure to noise. Examples include:

- Operating noisy machines during shifts when fewer people are exposed.
- Limiting the amount of time a person spends at a noise source.
- Providing quiet areas where workers can gain relief from hazardous noise sources (e.g., construct a sound proof room where workers' hearing can recover – depending upon their individual noise level and duration of exposure, and time spent in the quiet area).
- Restricting worker presence to a suitable distance away from noisy equipment.

Controlling noise exposure through distance is often an effective, yet simple and inexpensive administrative control. This control may be applicable when workers are present but are not actually working with a noise source or equipment. Increasing the distance between the noise source and the worker, reduces their exposure. In open space, for every doubling of the distance between the source of noise and the worker, the noise is decreased by 6 dBA.

Hearing protection devices (HPDs), such as earmuffs and plugs, are considered an acceptable but less desirable option to control exposures to noise and are generally used during the time necessary to implement engineering or administrative controls, when such controls are not feasible, or when worker's hearing tests indicate significant hearing damage.

An **effective program** must be implemented by employers in general industry whenever worker noise exposure is equal to or greater than 85 dBA for an 8 hour exposure or in the construction industry when exposures exceed 90 dBA for an 8 hour exposure. This program strives to prevent initial occupational hearing loss, preserve and protect remaining hearing, and equip workers with the knowledge and hearing protection devices necessary to protect them. Key elements of an effective hearing conservation program include:

- Workplace noise sampling including personal noise monitoring which identifies which employees are at risk from hazardous levels of noise.
- Informing workers at risk from hazardous levels of noise exposure of the results of their noise monitoring.
- Providing affected workers or their authorized representatives with an opportunity to observe any noise measurements conducted.
- Maintaining a worker audiometric testing program (hearing tests) which is a professional evaluation of the health effects of noise upon individual worker's hearing.
- Implementing comprehensive hearing protection follow-up procedures for workers who show a loss of hearing (standard threshold shift) after completing baseline (first) and yearly audiometric testing.
- Proper selection of hearing protection based upon individual fit and manufacturer's quality testing indicating the likely protection that they will provide to a properly trained wearer.
- Evaluate the hearing protectors attenuation and effectiveness for the specific workplace noise.
- Training and information that ensures the workers are aware of the hazard from excessive noise exposures and how to properly use the protective equipment that has been provided.
- Data management of and worker access to records regarding monitoring and noise sampling.

How to Improve Hearing Conservation Program

When it comes to hearing loss, prevention is key. Almost all work-related hearing loss is cumulative and permanent, so it’s important for employers to take steps to prevent damage before it happens.

A great step in preventing work-related hearing damage is to implement a **Hearing Conservation Program**. Not only do these programs protect workers from occupational hearing loss, but they can also play a role in increasing employees’ sense of well-being and reduce the incidence of stress-related disease. Stress decreases blood flow that helps hair cells within the ear work properly. Therefore, reducing workers’ stress can help maintain the overall health of the ear.

Hearing conservation is an OSHA mandate that requires companies to take action and institute occupational noise and hearing conservation programs for employees who work in areas where the probable exposure to noise equals or exceeds an eight-hour time-weighted average (TWA) sound level of 85 dB.

An effective hearing conservation program includes regular, ongoing sound monitoring, audiograms, employee training and protective equipment.

Regular, Ongoing Sound Monitoring

Sound level meters and dosimeters are two important elements of an effective hearing conservation program. Sound level meters measure sound intensity at a specific moment, while dosimeters measure a person’s average exposure to noise over a period of a time. Employers can monitor and record sound levels throughout the workplace to help employees understand areas where the risk of hearing loss may be higher.

Audiograms

An effective hearing conservation program includes taking a baseline audiogram, which takes place 14 hours or more after the employee was last exposed to occupational noise. Following the

baseline audiogram, annual audiograms should be performed to record any changes. These results should be analyzed and compared to previous tests to provide insights into how an employee's hearing has changed. These changes are recorded as a Standard Threshold Shift (STS) if the loss is greater than a certain level.

An STS is a detectable change in hearing when compared to the baseline audiogram. If a shift is identified, an employer is required to inform the employee within 21 days and refer them to an audiologist for follow-up testing and possible treatment. This also is a good opportunity for both employers and employees to assess hearing protection methods and make any needed changes.

Employee Training

Training workers is another essential step to educating a workforce about the risks associated with hearing loss and the importance of prevention. At a minimum, employers should conduct an annual noise training with all employees, but regular reminders throughout the year are also recommended. For example, hanging educational posters and noise maps, which highlight decibel levels throughout the workplace, is a great way to remind employees throughout the year to take steps to mitigate hearing damage.

It can also be helpful to offer one-on-one educational sessions with individual employees who may be exposed to louder noises on a regular basis.

Protective Equipment

In addition to monitoring and training, employers must also provide workers with suitable equipment to protect hearing while at work. In fact, this is an OSHA requirement for workplaces where the noise levels meet or exceed 85 dB.

There are a wide variety of options when it comes to hearing protective devices and employers can often find several appropriate options that fit the needs of employees and the workplace. Examples include earplugs and earmuffs that come in a wide variety of different styles, like disposable and reusable, to fit employers' and employees' preferences.