

Risk Manager

Answers, resources and information to help assess and reduce risk

Understanding Noise Exposure to Guard Against Hearing Loss By Mark Nease

According to the Occupational Safety and Health Administration (OSHA), about 30 million people in the United States are exposed to hazardous noise during the scope of their employment. Some of these employees have the potential to suffer some form of noise-induced hearing loss.

Hearing loss can be grouped into two categories: *Temporary Hearing Loss* and *Permanent Hearing Loss*. Temporary hearing loss occurs when a person is exposed to an elevated noise for a short duration. With temporary hearing loss, the person's ear canal becomes "stunned" by a short-term elevated noise; but hearing recovers to normal as time passes when secluded from noise. Permanent hearing loss, on the other hand, occurs when a person is exposed either to a sudden burst of noise or to an elevated noise over an extended duration.

Bear in mind that not all hearing loss occurs from exposure to noise. People can suffer permanent hearing loss through other means, such as through trauma to the ear, through improper medication use or through having a sickness or disease. Everybody is also susceptible to permanent hearing loss as they age. Hearing loss due to the aging process is identified by the term "presbycusis."

Awareness of Noise

The first step in protecting yourself from noise-induced hearing loss is to familiarize yourself with potentially hazardous noise sources. You then have to determine what length of time you will be exposed to that noise and how it could influence

your health.

The unit that quantifies noise in terms of sound pressure levels is a *decibel*. OSHA set parameters on safe noise levels. These can be seen via the chart below.

OSHA Permissible Exposure Limits to Noise

<u>Duration Per Day</u>	<u>Decibel Sound Level (dBA)</u>
8 Hours	90
6 Hours	92
4 Hours	95
3 Hours	97
2 Hours	100
1 1/2 Hours	102
1 Hour	105
1/2 Hour	110
1/4 Hour	115

* Exposure to impulsive or impact noise should not exceed 140 peak decibels.

According to the chart, you could avoid noise-induced hearing loss by working no more than 30 minutes when exposed to 110 decibels of noise. Likewise, you could receive hearing loss if you are exposed to a sudden blast of noise that has a decibel rating of over 140 decibels.

Noise can be measured with a *sound level meter* and a *noise dosimeter*. A sound level meter is a handheld

device that is used to measure noise as a spot sample. A noise dosimeter is a device that a person wears to measure all noise exposures over a period of time, typically the entire workday. The Center for Disease Control (CDC) identified average noise levels of items with which you may be familiar.

Noise Source	Decibels
Whisper	30
Normal Conversation	60
Leaf Blower	74
Vacuum Cleaner	75
Hair Dryer	90
Power Lawn Mower	90
Hand Drill (1/2" chuck)	92
Belt Sander	93
Tractor	96
Angle Grinder (4 1/2")	97
Impact Wrench	103
Circular Saw (7 1/4" blade)	105
Mp3 player (maximum volume)	105
Chain Saw	110
12-Gauge shotgun blast	165

Protection from Noise

When there is a noise exposure, a best practice in protecting yourself is to implement hearing conservation protocols. Adequate hearing conservation protocols involve five safety controls: Elimination Controls, Substitution Controls, Engineering Controls, Administrative Controls and Personal Protective Equipment (PPE) Controls.

Elimination Controls

Your first line of defense in protecting yourself from noise is to implement *Elimination Controls*. Elimination controls involve the removal of the noise source. Elimination controls offer the best protection, but sometimes are the hardest to accomplish. Examples include the following:

- Eliminating the continuous use of a copy machine (noise source) by submitting and using information electronically.

- Removing the mp3 player from your child to protect him from possibly damaging his hearing.

Substitution Controls

Your next line of defense in protecting yourself from noise is to implement *Substitution Controls*. Substitution controls involve the replacement of the noise source with tools/equipment that are quieter. Examples include the following:

- Replacing overhead projectors (noisy fans) with large screen televisions/monitors.
- Replacing pneumatic tools and gasoline-powered landscaping equipment with electric or cordless tools/equipment.
- Replacing your child's amplified electric guitar with a non-amplified acoustic guitar.

Engineering Controls

Your third line of defense in protecting yourself from noise is to implement *Engineering Controls*. Engineering controls involve the modification of equipment or otherwise, making physical changes to the noise source to isolate the noise from you. Examples of how you could use engineering controls include the following:

- Isolating the noise source using noise-absorbing partitions/mats.
- Applying noise damper material to sheet metal in order to dampen the emitting vibrations/noise. This practice is common in the automotive industry.
- Renovating your child's bedroom to make it more soundproof.

Administrative Controls

Your fourth line of defense in combating noise is to practice *Administrative Controls*. Administrative controls involve making changes to the tasks so that the noise exposure is minimized to safe levels for everybody. This control involves alternating the way people work. Some examples of administrative controls include the following:

- Practicing preventive maintenance on equipment so that the equipment operates in a like-new condition.

- Reducing the amount of time a person spends performing the noisy task, such as through employee rotations. For example, instead of having one person operate a power lawn motor for eight hours, have two people operate the lawn mower, each for four hours.
- Increasing your distance from the noise source.
- Setting "noise parameters" in your household; only permitting your child to practice his loud electric guitar for one hour instead of all evening hours.

it would be like to not be able to hear your loved ones if they call out to you for help.

For additional information or training on best practices and safety management within your school entity, please contact Director of Risk Management Sharon Orr at (866) 401-6600, ext. 7152 or sorr@cmregent.com.

Personal Protective Equipment (PPE) Controls

Your last line of defense in combating noise exposure is to use *Personal Protective Equipment (PPE) Controls*; most notably with hearing protection devices.

Hearing protection comes in two devices: *Acoustical Muffs* and *Ear Plugs*. Acoustical muffs are worn over your ears and earplugs are inserted into your outer ear canal. All hearing protection is required by the Environmental Protection Agency (EPA) to have stamping on the packaging and a noise reduction rating (NRR), which identifies how much that protective device will reduce the receiving noise when properly worn. You can use the NRR to select the best hearing protection to protect yourself from your noise environment. Note that the practice of stuffing cotton balls into your outer ear canal is not recognized as an adequate hearing protection control.

If you have ever been exposed to continuous loud noise, you may have noticed that you were able to adapt to that noise because it did not seem as loud as it was the first moment you heard it. Assuming that your ears can adapt to a noise is incorrect. In reality, your ears cannot adapt to a loud noise. What actually happens is that your ears begin to lose the ability to hear that noise.

Regardless of your age, consider that today is the best time to become aware of noise and how it could affect your hearing health. Otherwise, consider what