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**LOYOLA UNIVERSITY CHICAGO  
HEARING PROTECTION SAFETY GUIDELINES**

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**PURPOSE:**

These guidelines will help ensure that staff use hearing protection while in areas with increased sound levels.

**REGULATORY:**

29 CFR 1910.95 - Occupational noise exposure

[1910.95 - Occupational noise exposure. | Occupational Safety and Health Administration \(osha.gov\)](https://www.osha.gov/1910.95-Occupational-noise-exposure)

29 CFR 1910.95 – Appendix A through E (Mandatory) and Appendix F through H (Non-mandatory)

29 CFR 1904.10 - Recording criteria for cases involving occupational hearing loss. |

**Additional References:**

Center for Disease Control and Prevention (CDC)  
National Institute of Occupational Safety and Health (NIOSH)

**DEFINITIONS:**

**Occupational Noise:** It is any sound in the work environment. Occupational noise is the amount of acoustic energy received by an employee's auditory system when they are working in the industry. Noise is measured in units of sound pressure called decibels (dB).

**Sound Intensity or Acoustic Intensity:** The amount of sound energy in a space which is measured in decibels. The decibel scale is logarithmic, which means that loudness is not directly proportional to sound intensity. Instead, the intensity of a sound grows very fast. This means that a sound at 20 dB is 10 times more intense than a sound at 10 dB. How loud something sounds to you is not the same as the actual intensity of that sound.

**Loudness:** Loudness refers to how you perceive audible sounds (e.g., A sound that seems loud in a quiet room might not be noticeable when you are on a street corner with heavy traffic, even though the sound intensity is the same.) Noise is considered loud (hazardous) when it reaches 85 A-weighted decibels (dBA) or higher. A-weighted decibels are a scale for measuring noise. Hazardous noise can cause both hearing loss and tinnitus. Tinnitus is an annoying buzzing, rushing, or ringing noise in your ears or in your head.

**Exposure Action Value (EAV) or Permissible Exposure Limit (PEL):** The relationship between allotted noise level and exposure time.

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### GENERAL INFORMATION:

- About 22 million workers are exposed to hazardous noise on-the-job each year.
- In the U.S., hearing loss is the third most common chronic physical health condition among adults, after high blood pressure and arthritis.
- About 1 in 8 people in the U.S. working population have hearing difficulty. Among those with hearing difficulty, occupational exposures are the cause for 1 in 4 people.
- About 1 in 13 people in the U.S. working population have tinnitus, and 1 in 25 has both hearing difficulty and tinnitus.

Each industry is different, as workers' tasks and equipment differ, but most regulations agree that noise becomes hazardous when it exceeds 85 decibels for an 8-hour time exposure (typical work shift).

OSHA requires that employees be placed in a hearing conservation program if they are exposed to average noise levels of 85 dB or greater during an 8-hour workday. In order to determine if exposures are at or above this level, it may be necessary to measure or monitor the actual noise levels in the workplace and to estimate the noise exposure or "dose" received by employees during the workday.

NIOSH established a recommended exposure limit (REL) of 85 A-weighted decibels (dBA) averaged over an eight-hour workday. Workers who are exposed to noise at or above the NIOSH REL are at risk of developing significant hearing loss over their working lifetime.

Appendix A of this document details the average decibels associated with everyday sounds and noises and the typical response after routine or repeated exposure to those sounds or noises.

### POTENTIAL HEALTH EFFECTS:

Hazardous noise is one of the most common occupational hazards in workplaces. Exposure to high levels of noise may cause hearing loss, create physical and psychological stress, reduce productivity, interfere with communication, and contribute to accidents and injuries. Research shows that hearing loss is associated with cognitive decline and heart problems. Hearing loss and tinnitus can also impact your mental health, which may result in depression, anxiety, and a feeling of isolation and sadness.

The risk of damaging your hearing from noise increases with the sound intensity, not the loudness of the sound. Exposure to loud noises kills the nerve endings in the inner ear. More exposure will result in more dead nerve endings and the result is permanent hearing loss that cannot be corrected. Noise-induced hearing loss limits the ability to hear high frequency sounds and understand speech, which impairs the ability to communicate. Hearing aids may help, but they do not restore a person's hearing to normal.

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Hearing loss can result from a single loud sound near your ear, or more often, hearing loss can result over time from damage caused by repeated exposures to loud sounds. The louder the sound, the shorter the amount of time it takes for hearing loss to occur. The longer the exposure, the greater the risk for hearing loss, especially when hearing protection is not used or there is not enough time for the ears to rest between exposures.

### **SIGNS OF HEARING LOSS:**

- Having difficulty hearing when there is background noise.
- Thinking people are mumbling when they talk to you.
- Needing to ask others to repeat themselves often.

Often, those close to you will notice that you have hearing trouble before you notice it yourself.

### **TYPES OF HEARING PROTECTION:**

The choice of hearing protection is a personal one and depends on a number of factors. These include the level of noise reduction needed, comfort, and the suitability of the hearing protection for the worker and the work environment. The type of protection typically offered is the soft foam ear plug. Please contact your supervisor if a different type of hearing protection is necessary or desired.

### **HOW TO USE HEARING PROTECTION CORRECTLY:**

The effectiveness of hearing protection is reduced greatly if the hearing protectors do not fit properly or if they are worn only part time during periods of high noise exposure. Fitting earplugs into your ears takes a bit of getting used to, so it will take some time to familiarize yourself with the ear plugs and understand the anatomy of your ear.

Make sure that your hands are clean and be aware that sometimes when you insert the plug into your ear it may make you feel temporarily nauseous. This is a normal reaction and should cease as soon as the plug has been in position for a few seconds. Be aware that the orientation of your ear canals is backwards and upward; that is, they point towards the top of the back of your head. The earplugs must be fitted correctly for them to work effectively.

When inserting ear plugs:

1. Before putting ear plugs in, wash your hands to prevent infections or foreign materials from entering the ear.
2. Inspect the ear plugs for tears, cracks, or hardening. If an ear plug is damaged or hardened it should not be used.
3. To insert a soft foam ear plug, roll the plug between your fingers and thumb to compress it, making sure there are no wrinkles or creases in the plug.

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4. Working from the opposite side, reach one hand over your head and pull your ear outward and upward to widen the auditory canal. Insert the plug well into the ear and hold it in place for about 5-10 seconds, until it expands. Don't be afraid to place the plug into the ear canal. You cannot hurt your eardrum because the plugs are too short to reach it. If the ear canal is not completely plugged, the earplug will not be effective. Generally speaking, a soft foam ear plug that is inserted correctly will be unable to be seen from the front.

Appendix B of this document provides additional details on the proper procedure for inserting soft foam ear plugs.

### **How to remove a soft foam ear plug:**

Twist the plug gently to break the seal before removing the plug. If the ear plug cannot be removed, open your mouth as wide as possible (as with a large yawn) and the earplug should easily come out. Medical help should be sought if the earplug cannot be removed by the methods outlined above.

### **How often should soft foam ear plugs be changed:**

Soft foam ear plugs are made of polyurethane and typically have a short lifespan. They should be replaced every few uses or when they become dirty or damaged.

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**Appendix A**

**AVERAGE DECIBELS ASSOCIATED WITH EVERYDAY SOUNDS AND NOISES**

Everyday Sounds and Noises	Average Sound Level (measured in decibels)	Typical Response (after routine or repeated exposure)
Softest sound that can be heard	0	Sounds at these dB levels typically don't cause any hearing damage.
Normal breathing	10	
Ticking watch	20	
Soft whisper	30	
Refrigerator hum	40	
Normal conversation, air conditioner	60	
Washing machine, dishwasher	70	You may feel annoyed by the noise
City traffic (inside the car)	80–85	You may feel very annoyed
Gas-powered lawnmowers and leaf blowers	80-85	Damage to hearing possible after 2 hours of exposure
Motorcycle	95	Damage to hearing possible after about 50 minutes of exposure
Approaching subway train, car horn at 16 feet (5 meters), and sporting events (such as hockey playoffs and football games)	100	Hearing loss possible after 15 minutes
The maximum volume level for personal listening devices; a very loud radio, stereo, or television; and loud entertainment venues (such as nightclubs, bars, and rock concerts)	105–110	Hearing loss possible in less than 5 minutes
Shouting or barking in the ear	110	Hearing loss possible in less than 2 minutes
Standing beside or near sirens	120	Pain and ear injury
Firecrackers	140–150	Pain and ear injury

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**Appendix B**

**HOW TO INSERT SOFT FOAM EAR PLUGS CORRECTLY**

