Noise – Safety Checklist



PREAMBLE

NOISE INDUCED HEARING LOSS

Many tools, equipment, and processes in the workplace generate high levels of noise that will have a negative effect on the hearing of the exposed workers. Short loud bursts of noise such as explosions or gun shots can damage our ears in a short time of being exposed. Less hazardous noise such as woodworking equipment, heavy equipment, and machinery can lead to damage over an extended amount of time being exposed to the noise.

It’s hard to believe that noise can cause permanent damage to your hearing – but it can. It’s important to protect yourself against noise hazards.

It is recognized now, that Hearing Loss has a dramatic impact in our economy bourne out by statistics.

The steps to eliminate the negative effects of hearing loss, economically and personally, is done through **Disclosure of Hearing Loss, Workplace Accommodations and Managing Hearing Loss in the Workplace.**

Hearing is precious to us. Once we diminish or lose our hearing we can never fully recover it. Both on the job and at home there are many sources of noise which can damage our hearing. These sounds can damage sensitive structures in the inner ear and cause noise-induced hearing loss (NIHL). Approximately 26 million Americans have some type of noise-induced hearing loss. According to the CDC, over 22 million workers are exposed to hazardous noise levels at work each year. Occupational hearing loss is one of the most common workplace injuries today in the United States.

Ears Damaged from Noise

Hearing depends on a series of events that change sound waves in the air into electrical signals. Our auditory nerve then carries these signals to the brain through a complex series of steps. To breakdown the process simply- the sound waves travel through the ear and eventually move hair cells up and down in the ear that cause channels to open up. This allows chemicals to rush into a cell that creates an electrical signal that translates the sound into something we can understand.

Most noise-induced hearing loss is caused by the damage and eventual death of these hair cells. Unlike bird and amphibian hair cells, human hair cells don't grow back. They are gone for good.

Noise Induced Hearing Loss – Signs and Symptoms

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. It becomes noticeable to an individual when it is harder to understand someone talking or needing to turn the TV volume up.

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.

The NIOSH recommended exposure limit (REL) for occupational noise exposure (85 decibels, A-weighted, as an 8- hour time-weighted average [85 dBA as an 8-hr TWA]) was reevaluated using contemporary risk assessment techniques and incorporating the 4000-hertz (Hz) audiometric frequency in the definition of hearing impairment.
The new risk assessment reaffirms support for the 85-dBA REL. With a 40-year lifetime exposure at the 85-dBA REL, the excess risk of developing occupational NIHL is 8%—considerably lower than the 25% excess risk at the 90-dBA permissible exposure limit (PEL) currently enforced by the Occupational Safety and Health Administration (OSHA) and the Mine Safety and Health Administration (MSHA). NIOSH recommends a 3-dB exchange rate, which is more firmly supported by scientific evidence. The 5-dB exchange rate is still used by OSHA and MSHA, but the 3-dB exchange rate has been increasingly supported by national and international consensus. NIOSH recommends an improved criterion for significant threshold shift: an increase of 15 dB in the hearing threshold level (HTL) at 500, 1000, 2000, 3000, 4000, or 6000 Hz in either ear, as determined by two consecutive audiometric tests. The new criterion has the advantages of a high identification rate and a low false-positive rate. The NIOSH criterion no longer recommends age correction on individual audiograms. OSHA currently allows age correction only as an option. Finally, regarding hearing protection, NIOSH indicated that the noise reduction rating (NRR), a singlenumber, laboratory-derived rating that the U.S. Environmental Protection Agency (EPA) requires to be shown on the label of each hearing protector sold in the United States is not adequate. In calculating the noise exposure to the wearer of a hearing protector at work, NIOSH recommends derating the NRR by subtracting from the NRR 25%, 50%, and 70% for earmuffs, formable earplugs, and all other earplugs, respectively. Today, the issue of hearing protection attenuation is best addressed by testing the performance of hearing protection objectively. This fit testing technology is a huge advancement in efforts to save workers' hearing. Finally, the NIOSH criteria document provides recommendations for the management of hearing loss prevention programs (HLPPs) for workers whose noise exposures equal or exceed 85 dBA.