



NOISE EXPOSURE

This Fast Fact is intended to help workers, managers, employers and JHSC members understand recent changes to noise exposure requirements in Ontario.

WHAT IS NOISE?

Noise is any unpleasant or unwanted sound that is a result of pressure changes in the air created by vibrations, which are transferred to the ear by sound waves. The sound waves are then converted to electrical signals by delicate hair cells called cilia, found in the inner ear, or cochlea. These signals are transmitted to the brain and interpreted as sound. The effects of noise exposure are dependent on the level of noise, the frequency and the length of time that a person is exposed. Noise induced hearing loss (NIHL) is a permanent hearing impairment resulting from prolonged exposure to high levels of noise.

EFFECTS

Excessive exposure to noise can result in hearing loss and affect other body systems. Noise induced hearing loss is often ignored because there are no visible signs. It usually develops over a long period of time and except in very rare cases there is no pain. The primary effects of workplace noise exposure include noise-induced temporary threshold shift, noise induced permanent threshold shift, acoustic trauma and tinnitus.

- Temporary threshold shift is a short term decrease in hearing sensitivity which returns to pre-exposed levels if there is no continuous exposure to excessive noise.
- Permanent threshold shift can result in permanent hearing loss with ongoing and prolonged exposure to noise, or can be caused by one time exposure to an intense sound.
- Tinnitus or ringing in the ears is a disturbance produced by the inner ear and interpreted by the brain as sound. It can be short term or long term and may occur after

long-term exposure to high sound levels, or sometimes from short term exposure to very high sound levels.

- Acoustic trauma is a temporary or permanent hearing loss due to a sudden, intense acoustic or noise event, such as an explosion.

Noise can affect daily task performance by increasing fatigue, causing irritability and decreasing productivity. Noise can produce communication interference by making it more difficult to hear and be heard. If you need to raise your voice to be heard, then the noise level may be high enough to cause hearing loss.

LEGISLATION

O. Reg. 381/15 extends noise protection requirements to all workplaces in Ontario including construction projects, health care facilities, schools, farming operations, fire services, police services, and amusement parks as of July 1, 2016. The regulation establishes a maximum time weighted exposure limit of 85 decibels over an eight hour work day. Under the regulation employers must:

- take appropriate measures in order to protect workers if sound levels exceed 85 dBA over an 8 hour exposure.
- implement measures to decrease workers' exposure if sound levels exceed limits prescribed by the regulation.
- put in place measures to reduce workers' exposures based on a "hierarchy of controls" which could include engineering controls, work practices, and the use of personal protective equipment in the form of hearing protection devices.
- post clearly visible warning signs in areas where the sound levels exceed 85 dBA regularly.

RECOGNIZE, ASSESS AND CONTROL NOISE EXPOSURE

Sound levels varies in loudness, contains a mix of frequencies and varies with time. The intensity of the sound levels is expressed in decibels which represents a logarithmic unit of measure. Noise levels are expressed as dB(A) where the “A” scale represents how the human ear responds. Recognize areas in the workplace where the noise level may pose a hazard. Raising your voice to be heard, the inability to hear a person speaking who is one metre away and/or pain or ringing in the ears after noise exposure are examples of situations where noise may be a hazard. In these areas, noise monitoring is prudent.

Decibels	Examples
150	Jet take-off
140	Firing range
130	Jack hammer, rock concert
120	Band Practice
110	Dance Club
90	Subway, boiler room, chiller
85	Sirens (window up)
80	Busy street
75	Air handling platform
70	Busy Street
60	Restaurant conversation
40	Typical Office

Assess the risk by comparing noise exposure level to legal requirements. Setting an organizational action level of 80 dBA will further minimize negative health effects. The Canadian Standards Association's Standard Z107.56-13 provides guidance in appropriate equipment choice, specifications and/or procedures for the measurement and calculation. Noise measurements in the workplace can be measured using a dosimeter, or an integrating sound level meter. The instruments must be calibrated and the measurements should be carried out by someone with special training in interpreting the data.

The hierarchy of controls highlights the principal that the best prevention strategy is to eliminate noise exposure that can lead to hearing loss. This can be achieved by incorporating controls at the source, along the path and at the worker. Engineering controls are the preferred methods while controls at the worker are the last resort.

- Engineering controls include replacing noisy equipment with quieter equipment, isolating workers from noisy areas by having them work in an enclosed room, isolating noisy areas with sound barriers, or isolating noisy equipment in an enclosed room
- Administrative controls include job rotation or preventive maintenance programs for equipment
- Personal protective equipment (PPE) in the form of hearing protection that is appropriate, a proper fit and effective.

Organizations that have a potential for noise exposure should consider implementing a hearing loss prevention program that includes noise measurement, education and training, noise control, hearing protection, posting of warning signs, hearing tests and annual program review.

REFERENCE LIST

Canadian Centre for Occupational Health and Safety, viewed May 10, 2016, http://www.ccohs.ca/oshanswers/phys_agents/noise_measurement.html

Canadian Standards Association, Hearing loss prevention program (HLPP) management, CSA Z1007-16

Canadian Standards Association, Hearing Protection Devices – Performance, Selection, Care and Use, CSA Z94.2

Canadian Standards Association, Measurement of Noise Exposure, CSA Z107.56-13

Ministry of Labour, New Noise Regulation, viewed May 10, 2016, <http://www.labour.gov.on.ca/english/resources/notices.php>

OSHA Technical Manual, Section III: Chapter 5 Noise. Viewed May 10, 2016, https://www.osha.gov/dts/osta/otm/new_noise/index.html#costofhearing