DOING SOMETHING ABOUT WORKPLACE NOISE

An Ergonomic Approach
Fitting the workplace to the worker
(i.e. create a soundscape conducive to productivity)

Soundscape
A sound or combination of sounds that forms or arises from an immersive environment

Wikipedia

Ontario Law says:
no worker should be exposed to more than the equivalent of 85 dBA in an eight hour working day

...but...

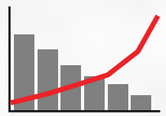
Scientific Studies show:
that workers can lose their hearing at 80 dBA

GOALS

How much noise is too much noise? That depends on your goal(s):

Meet the minimal requirements of the law (see above)

Prevent hearing loss (below 75-80 dBA)



Improve productivity

Prevent accidents / related ailments

Goals for noise control efforts:

Quick results to establish confidence in efforts

Impact the greatest number of workers

Deal immediately with a particularly distracting/ annoying noise

Arm Length Rule

If you are an **arm length away** from someone and you need to raise your voice to be understood, the noise is probably loud enough to cause long term damage to your hearing.

Ontario Law also clearly indicates that hearing protection (ear plugs and muffs) are ***only to be used*** if engineering controls are not practical under the circumstances.

EFFECTS of Noise on Workers
...beyond hearing loss

Increased stress, anxiety, anger and frustration

Reduced alertness and inhibited communication which can lead to accidents

Inability to focus resulting in poor productivity and reduced quality of work

Other health effects including Cardiovascular and Gastro-intestinal issues

Mental health issues related to the frustration and embarrassment associated with hearing loss as well as feelings of loneliness and isolation

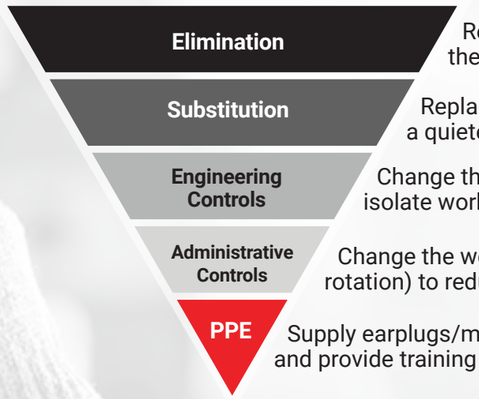
BENEFITS of Noise Control

Less maintenance and replacement of equipment

Fewer accidents, sick days and insurance claims

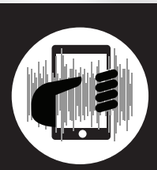
Improved employee morale, productivity, company reputation

HIERARCHY of CONTROL



Examples of Control Measures

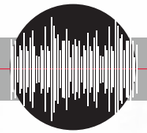
Noise Source	Possible Noise Control Measures
Vibration of parts or panels	• Tighten parts or panels • Cover them with a rubbery material
Transmission of vibration	• Install isolation dampers (springs, cork, etc.)
Impact of parts on a hard surface	• Tilt the plate on which the parts are falling • Cover it directly or in a sandwich with a rubbery material
Mechanical noise	• Use helicoidal gears instead of toothed gears • Use plastic materials • Balance (equilibrate) rotating parts
Aerodynamic noise	• Avoid discontinuities (elbows) or sharp edges in the air stream • Use silencers in ducts
Air jets	• Use exhaust mufflers for decompression air jet • Use special air guns • Reduce the air velocity of the jet • Avoid impact of air jet on a sharp edge or perpendicular to a surface
Acoustic enclosure on a machine	• Use hermetic enclosure covered with rubbery materials • Install sound absorbing materials inside the cover
Pure tones	• Regulate the speed of rotating parts to minimize pure tones • Balance (Equilibrate) rotating parts • Dampen the blade on power saws • Use rubbery materials on resonating parts
Distance from source	• Move the source away from the workers • Install a noise barrier between sources and workers
Reverberation of noise in a room	• Add some absorbing materials if the room is highly reverberant • Check noise transmission from adjacent rooms or from the outside



USE OF APPs on mobile phones/devices for measuring noise is suitable if a "good ballpark" reading is adequate for the purpose. For best results though it is recommended to calibrate the app against a proper noise level meter (NLM).

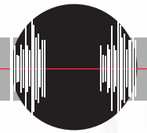
For a list of some of the **best availabe noise measurement apps** visit:
www.ohcow.on.ca/avoidnoise/

Types/Categories of Noise

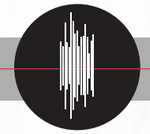


Constant
Noise that's always there and doesn't really change all that much (e.g. exhaust fan)

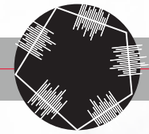
Fluctuating
Noise that changes its loudness over time (e.g. the cycling of a machine)



Periodic
Noise that is created during regular or irregular time intervals (e.g. using a saw infrequently)



Impact
Sudden noise caused by two things hitting each other (e.g. using a hammer or dropping a metal part into a metal bin)



Reverberation
Sound that ***bounces*** around within a workspace

Vibration
Low frequency noise which travels through floors, walls and other structures and is felt as vibration

Pure Tone
An annoying sound that corresponds to a particular frequency (e.g. siren)

Resonance
A particular frequency that causes vibration in something receiving the noise (e.g. feeling one's insides vibrate when exposed to loud noise/music)

1 DETERMINE *if* NOISE IS TOO LOUD

ASSESS the noise using the **Arm Length Rule** (see p1).

USE a noise level meter (NLM) if one is available to you.

USE a noise measurement app on your phone/mobile device. Make sure it is a good one...visit **ohcow.on.ca/avoid-noise** for a list.

CALIBRATE* the app to ensure accuracy.

* compare it to a proper noise meter

Remember to take into account **additional background noise** if present

Bottom Line on Noise

If workers are being bothered by noise* or are already wearing hearing protection, the noise problem needs to be addressed.

* see Effects of Noise (p1)

2 IDENTIFY and DESCRIBE the NOISE SOURCES

DETERMINE the following when dealing with noise:

- WHERE is it coming from?
- WHEN does it occur?
- WHY is it happening?
- HOW is it being transmitted?

Some of this will be obvious, some of it will require some detective work!

DETERMINE the types of noise you are dealing with:

- Constant
- Fluctuating
- Periodic
- Impact
- Reverberation
- Vibration
- Pure Tone
- Resonance

See **Types/ Categories of Noise** above

Knowing the type(s) of noise helps in determining what type of controls will be needed to manage it.

PRIORITIZE noise source(s) if there is more than one. Different types of noise require different control strategies*. The measurements taken is Step 1 can help you prioritize different noise sources.

*see **Examples of Control Measures** chart on p1

3 IMPLEMENT CONTROLS

Can we make it quieter?

ASSESS noise control options based on the source and type of noise – very situation is unique and requires different considerations.

ASSESS current processes to determine if *administrative* controls/changes are needed.

DETERMINE approach and then:

1. ASSIGN responsiblities for implementation
2. SET a target date for completion
3. MEASURE noise before and after implementing controls

BUY QUIET whenever purchasing new equipment...the best strategy to reduce noise in the workplace.

A **Great Resource** from the Occupational Health and Safety Council of Ontario (OHSCO):

Noise Control Tool: Concrete Actions and Specific Recommendations

www.pshsa.ca/wp-content/uploads/2015/09/NoiseControl.pdf

4 BUILD AWARENESS

ALLOW workers the opportunity to contribute to their hearing preservation and optimize the workplace soundscape.

COMMUNICATE your intentions, rationale, successes/failures – communication goes a long way in building confidence and support for you efforts.

POST warning signs (over 85 dBa).*

PROVIDE training on the importance and fit of hearing protection (if required).

REMIND worker to be conscious of any additional noise they create – everyone has different tolerance levels.

HOLD those responsible for investigation and implementation accountable for results.

* it's the Law

5 EVALUATE YOUR EFFORTS

ASK those affected by the noise if things have improved – can they ***hear*** a difference?

TAKE a new noise measurement for comparison.

MAKE sure you are comparing apples-to-apples – same measurement device, same location, same situation (time of day, equipment running, etc.).

COMPARE the new measurements to your original goal.

CONTINUE to enforce hearing protection requirements (earplugs/muffs) until your goal is met.

TEST workers hearing periodically using audiometric (hearing) tests.

If hearing protection is being used and you see a downward trend in testing results, it is likely a result of:

- wrong type and/or fit
- improper use (wearing incorrectly or not enough)

GET professional help if you are unable to achieve improvement

REMEMBER: **Ontario law** clearly indicates that hearing protection (ear plugs and muffs) ***are only to be used*** if engineering controls are not practical under the circumstances.

Hearing protection (earplugs/muffs) is a temporary ***bandaid*** solution. Keep working to control/minimize the noise.

Occupational Health Clinics for Ontario Workers

For professional help in dealing with noise issues in the workplace, arrange a free consultation with one of the Multi-disciplinary Occupational Health Teams at OHCOW

1-877-817-0336
www.ohcow.on.ca