

# NOISE DAMAGES HEARING



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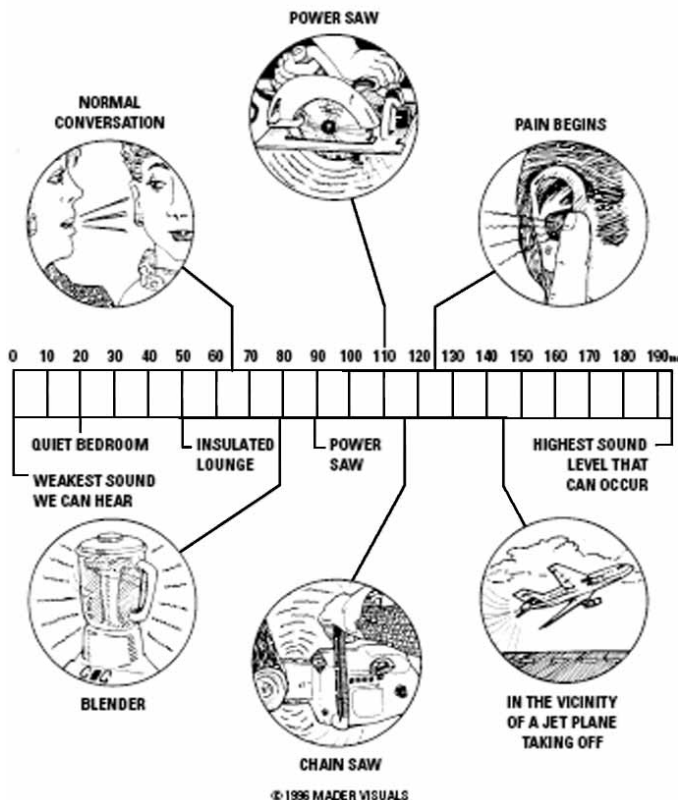
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**WHAT IS NOISE? NOISE IS UNWANTED OR UNPLEASANT SOUND. SOUNDS MAY BE NOISE TO SOME PEOPLE AND A PLEASURE TO OTHERS. SOUND IS A FORM OF ENERGY THAT CAUSES PARTICLES IN THE AIR, A LIQUID OR A SOLID TO VIBRATE.** The human ear detects the vibrations and the brain interprets the vibrations as sounds (noise). Sound intensity is measured by a sound meter in decibels. Sound can also be measured by its frequency; a high frequency sound usually has a high pitch. Low frequency sound produces low pitch, such as vibration-like sounds from sub-woofers of speakers. Sound intensity is, however, more important in determining whether a sound will damage hearing. Here are some examples of common noise sources and their decibels (intensity).

Measuring workplace noise is not as simple as adding the measurement of sound levels from different sources. For example, two noise sources that each makes 80 dB does not add up to make 160 dB. The answer would be 83 dB. So a 3 dB increase in sound intensity is a doubling of sound intensity, and a significant increase in noise exposure.

## WHAT SOUND (NOISE) LEVELS DAMAGE HEARING?

The United States National Institute for Occupational Safety and Health (NIOSH) Revised Criteria (1998) for Occupational Noise Exposure describes the damage caused by workplace noise. It suggests that 23 to 32% of 60 year old workers will have significant problems hearing in a quiet room if they were exposed to occupational noise at 90dB over an 8 hour shift for 40 years. Also 8 to 14% of the workers will be affected when exposed to 85dB and 1 to 5% will be affected when exposed to 80 dB. NIOSH recommends that exposure should not exceed 85 dB over 8 hours. For each increase of 3dB, the exposure time should be decreased by half.



### Example:

Decibels	Exposure Time
85dB	8 hrs
88dB	4 hrs
91dB	2 hrs
94dB	1 hr

If you have to shout to be heard when the other person is only a few feet away, you are likely exposed to excessive noise. There will be individual variation and the above recommendation will not be sufficient to protect everyone in the workforce.

The Workplace Safety & Insurance Board (WSIB) considers claims for noise induced hearing loss when a worker can prove that they have had continuous exposure to noise levels at 90 decibels or more for 8 hours a day for a minimum of 5 years. Under certain conditions they have allowed claims for lower exposure levels.

## WHAT IS OCCUPATIONAL NOISE INDUCED HEARING LOSS?

Occupational noise induced hearing loss is caused by exposure to high frequency sound levels in the workplace. Over periods of time these high frequency sound damage the hair cells of the cochlea (*inner ear*). At first the noise exposure may cause a temporary threshold shift; that is, a decrease in hearing sensitivity that usually goes back to normal in a few minutes to a few hours. Repeated exposure leads to permanent hearing loss.

## OTHER CONDITIONS RELATED TO OCCUPATIONAL HEARING LOSS

### TRAUMATIC EVENT

An example of this is a worker is near an unexpected loud noise and suffers hearing loss.

### OTOTOXCITY

This occurs when a worker is exposed to high levels of noise and solvents at the same time, the solvent may speed up the hearing loss process.

## OTHER TYPES OF HEARING LOSS

### PRESBYCUSIS

This is when hearing loss occurs naturally due to aging.

### MIDDLE EAR DISEASE

This may be caused by obstruction of a tube between the ear and the nose, causing fluid build-up and eardrum destruction. Sometimes the bones in the middle ear fuse causing a condition called otosclerosis. Ear wax build-up in the outer ear canal can cause hearing loss, which can be treated by removing the wax.

### MENIERE'S DISEASE

The inner ear condition called Meniere's disease is associated with fluctuating hearing loss, ringing in the ear and balance problems (the room spins around).

### RECREATIONAL ACTIVITIES

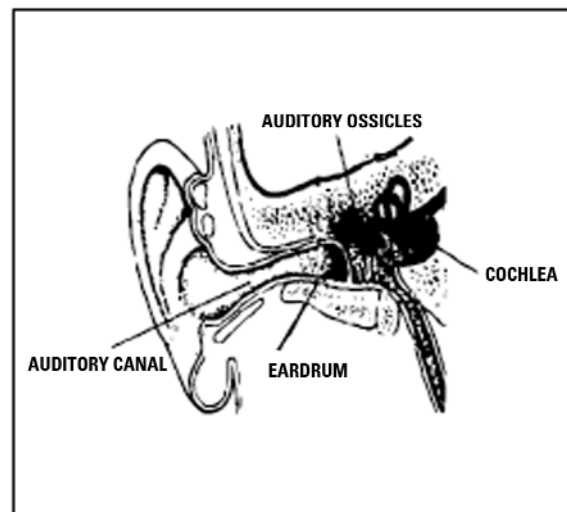
Exposure such as from target practice with a gun or loud music can also damage hearing. Fortunately, most people are not exposed to recreational noise for 8 hours or more a day.

### MEDICATION

High doses of certain drugs can damage the inner ear, impairing hearing and balance.

## WHAT ARE SIGNS THAT YOU HAVE HEARING LOSS?

- You can't hear when the TV or radio is on at normal volume.
- Words become garbled and fuzzy when someone speaks in a crowded room.
- You laugh when others laugh, but really you don't know why they are laughing.
- You get confused and feel left out of conversations.
- You have trouble understanding young children as their words sound garbled.



## HOW DO YOU KNOW WHEN YOUR HEARING IS DAMAGED?

Hearing loss caused by noise usually affects the inner ear. A doctor looking into your ear may see a normal eardrum. The damage lies deeper in the inner ear. You may not notice early hearing loss because it usually affects high frequency or high pitch sounds, which are less important in hearing speech. As the hearing loss proceeds, you will experience difficulty hearing in a crowded room or in the presence of noise. Later on you will experience hearing loss even in a quiet room. You may also have a “ringing” noise (*tinnitus*) in your ear. Sometimes the “ringing” bothers you more than the hearing loss because of interference with sleep and concentration.

Early hearing loss can only be detected by a hearing test conducted by an audiologist or an ear, nose and throat specialist.

## HOW DO I PREVENT HEARING LOSS FROM NOISE?

Talk to your Joint Health and Safety Committee about any concern you have with noise levels.

They can measure the noise and if it is too loud they can take the following steps.

(a) Control noise:

At the Source:	Select quiet equipment, maintain equipment adequately. Install vibration isolation mounts, mufflers
Along the Pathway:	Erect barriers and isolate noise source, insulate noise sources
At the Worker:	Wear ear protection, such as ear plugs or ear muffs.

The Joint Health and Safety Committee may want to set up a hearing conservation program. That includes measuring the noise in the workplace, regular hearing check ups and controlling noise sources in the workplace.

The Occupational Health Clinics for Ontario Workers Inc. can provide information with recommendations for a noise assessment and control program. The NIOSH Occupational Noise Exposure 1998 document will also be very useful:

You can obtain a copy by calling the Occupational Health Clinics for Ontario Workers or contacting NIOSH at [www.cdc.gov/niosh](http://www.cdc.gov/niosh). Click on publications, scroll down to 1998 and the document will be there for you to download.

## WHAT TYPE OF EAR PROTECTION SHOULD BE USED?

To prevent noise from reaching your eardrums, you can use ear muffs, ear plugs (*formable type and plastic types*) and ear canal caps. Ear protection is given a noise reduction number rate (NRR) which is shown as a number. The noise reduction rating is determined in a laboratory and does not reflect actual use in the workplace. The numbers should be reduced by about 25% for muffs, 50% for formable plugs and 75% for ordinary plugs. For example, a formable plug rated at an NRR of 29 dB may reduce noise by about 15 dB.

Using ear plugs and muffs together can afford better protection.



Ear muffs last longer, are not easily lost, and are dependable over a longer time. They may, however, be uncomfortable in hot weather, not compatible with eye/safety glasses, some faceshields, and respirators. Ear muffs are bulky and difficult to carry.

Earplugs are good for low frequency sounds. They are compatible with hot environments, easy to store and compatible with glasses, etc. Ear plugs are easily lost, contaminated and may cause ear canal irritation. They may also not be fitted properly.

The Canadian Safety Association (CSA) has standards on ear protection equipment, which you can use as a guide.

## WILL A HEARING AID “CORRECT” YOUR HEARING?

The hearing system is complex. Present hearing aids have advanced greatly over the past twenty years but still cannot “correct” your hearing loss in a manner that glasses can “correct” vision. Properly fitted aids will lessen the sense of isolation. You will need a period of adjustment to appreciate a hearing aid.

## IS HEARING LOSS FROM NOISE AT WORK COMPENSABLE?

If you suspect your hearing has deteriorated as a result of workplace noise exposure:

- (a) get a hearing test through your family doctor and see an ear specialist;
- (b) if the doctor determines that you have noise-induced hearing loss, ask your family doctor to file a claim to the Workplace Safety and Insurance Board together with the hearing test report and the ear specialist’s report. You may be eligible for payment of hearing aids or a non economic loss award.
- (c) report any significant ringing noise (tinnitus) in the ear

If the claim is accepted and your hearing levels have deteriorated sufficiently you may qualify for a hearing aid and non-economic loss (NEL) benefits.

If you need further information about hearing loss and workplace noise exposure contact the Occupational Health Clinics for Ontario Workers nearest you.

## DO YOU HAVE HEARING LOSS?

Does your spouse complain about how loud the T.V. is?	YES	NO
Do your children say you ignore them when they talk to you?	<input type="checkbox"/>	<input type="checkbox"/>
Do you sometimes have trouble understanding telephone conversations?	<input type="checkbox"/>	<input type="checkbox"/>
Do you miss parts of what is being said in a room full of people?	<input type="checkbox"/>	<input type="checkbox"/>
Does a buzzing or ringing sound keep you awake at night?	<input type="checkbox"/>	<input type="checkbox"/>
Do you ever not hear the telephone or door bell ring?	<input type="checkbox"/>	<input type="checkbox"/>
Do you turn your radio up at the end of the radio?	<input type="checkbox"/>	<input type="checkbox"/>

If you answered yes to any of these questions it may be time to have your hearing examined.

OHCOW can help by:

- Providing facts on noise induced hearing loss
- Investigate reducing noise levels in your workplace
- Refer you to a specialist
- Determine if you have work related hearing loss

## OHCOW OFFICES

If you need further assistance, call the Occupational Health Clinic for Ontario Workers Inc. Closest to you.

### HAMILTON

848 Main Street East  
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