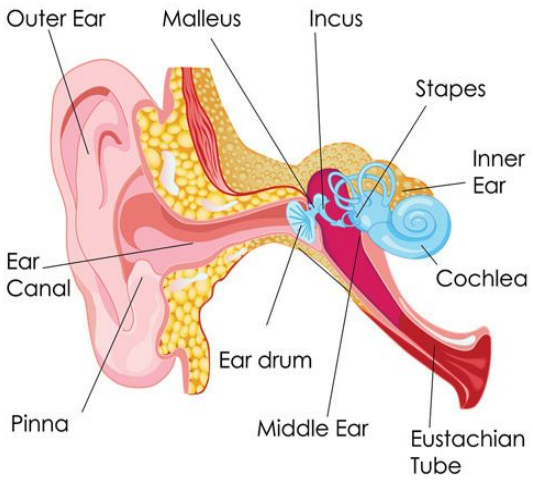
**Hearing Loss Explained**

There are three main components of the human ear:




The outer ear, the middle ear, and the inner ear. For today’s toolbox talk we will look at all three, however we will focus most of our attention on the inner hear to see what effect a loud noise and what effect a repetitive noise from machinery will have on hearing.

Sound waves pass through the outer ear and cause vibrations at the eardrum. The eardrum and three small bones of the middle ear amplify the vibrations as they travel to the inner ear. There, the vibrations pass through fluid in a snail-shaped structure in the inner ear called the cochlea.( pronounced coke-klee-ahh)

Attached to nerve cells in the cochlea are thousands of tiny hairs that help translate sound vibrations into electrical signals that are transmitted to your brain. The vibrations of different sounds affect these tiny hairs in different ways, causing the nerve cells to send different signals to your brain. That's how you distinguish one sound from another.

**How hearing loss can occur**

**Causes of hearing loss include:**

Damage to the inner ear, aging and exposure to loud noise may cause wear and tear on the hairs or nerve cells in the cochlea that send sound signals to the brain. When these hairs or nerve cells are damaged or missing, electrical signals aren't transmitted as efficiently, and hearing

loss occurs. Higher pitched tones may become muffled to you. It may become difficult for you to pick out words against background noise. Heredity makeup may make you more prone to these changes. This type of hearing loss is known as sensorineural (pronounced sensor-ree-neural) hearing loss, which is permanent.

**A gradual buildup of earwax**. Earwax can block the ear canal and prevent conduction of sound waves. This can be restored with earwax removal.

**Ear infection and abnormal bone growths or tumors**. In the outer or middle ear, any of these can cause hearing loss.

**Ruptured eardrum (tympanic membrane perforation).** Loud blasts of noise, sudden changes in pressure, poking your eardrum with an object and infection can cause your eardrum to rupture and affect your hearing.

**Risk Factors**

Factors that may damage or lead to loss of the hairs and nerve cells in your inner ear include:

**Aging:** Degeneration of delicate inner ear structures occurs over time.

**Loud noise:** Exposure to loud sounds can damage the cells of your inner ear. Damage can occur with long-term exposure to loud noises, or from a short blast of noise, such as from a gunshot.

**Heredity:** Your genetic makeup may make you more susceptible to ear damage from sound or deterioration from aging.

**Occupational Noises:** Jobs where loud noise is a regular part of the working environment, such as farming, construction or factory work, can lead to damage inside your ear.

**Recreational Noises:** Exposure to explosive noises, such as from firearms and jet engines, can cause immediate, permanent hearing loss. Other recreational activities with dangerously high noise levels include snowmobiling, motorcycling or listening to loud music.

**Some medications:** Drugs, such as the antibiotic gentamicin and certain chemotherapy drugs, can damage the inner ear. Temporary effects on your hearing — ringing in the ear (tinnitus) or hearing loss —

can occur if you take very high doses of aspirin, other pain relievers, antimalarial drugs or loop diuretics.
**Some Illnesses:** Diseases or illnesses that result in high fever, such as meningitis, may damage the cochlea.

## Key Point

Hearing loss from noise is so gradual and painless, you may not even notice. But once it occurs, noise-induced hearing loss is permanent and irreversible.

**Warning Signs of Noise-Induced Hearing Loss**

- A ringing or buzzing in the ears immediately following exposure to noise.

- A slight muffling of sounds making it difficult to understand people once you leave a noisy area.

- Difficulty understanding speech. You can hear the words but not understand all of them.

**Protecting Yourself**

- Reduce your exposure to noisy situations whenever possible.

- Keep television and music set at a reasonable volume. Set the levels in a quiet atmosphere and don't raise volumes to drown out background noise.

-Wear hearing protection whenever you are using noisy equipment such as air impact tools, compactors, crushers lawnmowers or leaf blowers and in any noisy environment.

-Have your hearing tested every two years by an audiologist especially if you experience any of the symptoms listed above.

Don't Miss the moments that Matter !!

# Reference Chart of different sound levels of common noise

## Listen to the warning while you still can . . .

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- Keep television and music set at a reasonable volume. Set the levels in a quiet atmosphere and don't raise volumes to drown out background noise.
- Wear hearing protection whenever you are using noisy equipment, such as lawnmowers or leaf blowers, and when you are in noisy environments.
- Have your hearing tested every two years by an audiologist, especially if you experience any of the symptoms listed above.

For more information, contact
**Canadian Hearing Society**
Phone **416.928.2500**
Toll-free Phone **1.877.347.3427**
Toll-free TTY **1.877.216.7310**
or visit **chs.ca**

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## Are you at risk of noise-induced hearing loss?

Experts agree that continued exposure to noise of 85 decibels [dB(A)], over time, will harm hearing. Check the chart below to see if you are at risk.

| Sound | Noise Level in decibels [dB(A)] |
|---|---|
| **Impulse sounds** | |
| Rifle shot | 163 |
| Fireworks (at 1 m) | 162 |
| Balloon pop | 157 |
| Cap gun | 156 |
| Firecracker | 150 |
| **Beyond threshold of pain** | |
| Airplane taking off | 140 |
| Noisy squeeze toys | 135 |
| **Threshold of pain** | |
| Jet take-off (30-61 m) | 130 |
| **Threshold of sensation** | |
| Thunderclap (near) | 120 |
| Nightclub | 120 |
| Boom box stereos (max vol) | 120 |
| Ambulance siren | 120 |
| Movie theatre | 117 |
| Chain saw | 116 |
| **Regular exposure of more than 1 minute risks permanent hearing loss** | |
| Power saw/Leaf blower | 110 |
| Rock band or concert | 110 |
| Symphony or ballet | 110 |
| Busy video arcade | 110 |
| Snowmobile/Snow blower | 105 |
| Jet flying over (305 m) | 103 |
| Garbage truck | 100 |
| Personal stereo system (volume at 5 out of 10) | 100 |
| Fitness class with music | 95 |
| Jet boats/Water craft | 95 |
| Subway | 90 |
| Lawnmower | 90 |
| **Level at which damage begins (8 hours at a time, over time)** | |
| Electric razor | 85 |
| Noisy restaurant | 85 |
| Telephone dial tone | 85 |
| **Annoying, interferes with conversation Regular exposure can cause damage** | |
| City traffic noise | 80 |
| Washing machine | 78 |
| Dishwasher | 75 |