



OCCUPATIONAL HEARING LOSS

Information about hearing loss and how it may affect University personnel who may be exposed to noise

EXPOSURE TO LOUD NOISE CAN CAUSE HEARING LOSS

Exposure to loud noise can damage the hair cells in the inner ear and the hearing nerve. One or both ears can be affected.

- **Long-term, chronic exposure** to loud noise can cause permanent hearing loss.
- **Short-term exposure** to a loud noise may cause a temporary change in hearing (ears may feel clogged) or ringing in one or both ears.
- If a short-term noise is loud enough, it can cause immediate and permanent hearing loss.

Exposure to loud noise at work and home can both contribute to hearing loss.

SIGNS OF HEARING LOSS

- > Having difficulty hearing when there is background noise
- > Thinking people are mumbling when they talk to you
- > Needing others to repeat themselves often

HEALTH EFFECTS OF EXPOSURE TO LOUD NOISE

The health effects of loud noise are often gradual and may not be noticeable until the damage becomes worse. The effects of noise-induced hearing loss can be profound, limiting the ability to hear high frequency sounds and understand speech, seriously impairing the ability to communicate.

Even a small amount of hearing loss can have effects both at work and home, making it **challenging to maintain relationships** and **respond to alarms** such as smoke detectors.

Loud noise can:

- Create physical and psychological stress
- Cause tinnitus (ringing or buzzing in the ears, can be temporary or constant)
- Reduce productivity
- Interfere with communication and concentration
- Contribute to workplace accidents and injuries by making it difficult to hear warning signals

OCCUPATIONAL HEARING LOSS

Occupational (work-related) hearing loss is preventable when appropriate controls and hearing protection are used. There are various sources of noise that can be found in UW locations and facilities, such as mechanical rooms with air handling units, the power plant, machine shops, performing arts spaces, and areas under construction.

Sources of noise can also come from operating machinery or equipment, using tools, and performing noise-producing activities.

The table below shows the **workplace noise exposure limits** set by the federal Occupational Safety and Health Administration (OSHA).

How long can you listen without hearing protection?

Source: [Allowable Noise Exposures](#) (osha.gov)

Decibels	Time	Examples
Above 115	0 minutes	Jackhammer Drill (pneumatic) Heavy machinery
115	15 minutes	Forklift
110	30 minutes	Chainsaw
105	1 hour	Hedge trimmer
100	2 hours	Leaf blower Pressure washer
95	4 hours	Drill (electric)
90	8 hours	Air compressor Lawn mower

HEARING LOSS PREVENTION AT THE UW

The UW [Hearing Loss Prevention Program](#) establishes requirements and procedures to control exposure to noise levels that could result in hearing loss and ensure personnel exposed to noise are protected.

1. **Ask your supervisor** if hearing protection is required when using a tool, performing an activity, or entering certain areas.
2. **Look for signs** indicating the use of hearing protection is recommended or required.



Visit the [Hearing Loss Prevention page](#) on the Environmental Health & Safety website for more information. Contact EH&S at (206) 543-7388 or ehsdept@uw.edu with questions.

It may be too loud in your workplace if you:

- > Hear ringing or humming in your ears when you leave work
- > Must shout to be heard by a coworker an arm's length away (3 feet)
- > Experience temporary hearing loss after leaving work

NON-OCCUPATIONAL HEARING LOSS

Exposure to noise outside of work can also contribute to hearing loss. Examples include attending a concert, using power tools for home projects, using public transportation such as a light rail or train, using firearms and riding a motorcycle.

It is important to consider all sources of noise exposure to prevent hearing loss. Noise controls and hearing protection (e.g., ear plugs or ear muffs) worn at work can also be used to reduce the risk of hearing loss outside of work.

OTHER CONTRIBUTORS TO HEARING LOSS

Some chemicals (called "ototoxic chemicals") can both cause hearing loss and make the ear more susceptible to hearing damage. Personnel may be exposed to ototoxic chemicals at work or outside of work through inhalation, absorption through the skin, or ingestion. Follow all required and recommended safety practices when working with or around ototoxic chemicals, such as:

- **Solvents** (styrene, trichloroethylene, toluene, xylene, ethylbenzene)
- **Metals** and compounds (mercury compounds, lead, organic tin compounds)
- **Asphyxiants** (carbon monoxide, hydrogen cyanide and its salts, tobacco smoke)
- **Nitriles** (3-butenenitrile, cis-2-pentenenitrile, acrylonitrile)
- **Pharmaceuticals** (certain antineoplastic agents and certain antibiotics)
- Certain **pesticides**

Aging can also cause a gradual decrease in hearing.

THE HEARING PROCESS

Sound waves travel through the ear canal and vibrate the ear drum. There are three bones attached to the ear drum that transfer the vibrations to the inner ear. The inner ear contains thousands of **tiny hair cells** (in the cochlea). The hair cells detect the pitch of the vibrations and convert them to electrical impulses, which are transmitted to the brain via the hearing/auditory nerve where they are interpreted as sound. Damage to the hair cells and hearing nerve that occurs after exposure to loud noise is called sensorineural hearing loss.

