

# Chemicals That Affect Hearing & Balance

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## What are ototoxic chemicals?

Chemicals that cause harm to hearing and balance are called **ototoxic**. Ototoxic chemicals can cause hearing loss. Sometimes, hearing loss can be worse when the person has been exposed to both ototoxic chemicals and loud noises. Damage can occur, even if both the noise and the chemical are at recommended levels. You can be exposed at work or at home. Medications that we take can be ototoxic. Your doctor will tell you if your medicine puts you at risk.

## What are some examples of chemicals associated with hearing loss, and where they are found?

You can find ototoxic chemicals in many common household items, like cleaners, gardening supplies, and paints.

Check labels for these chemicals:

- arsenic—found in parasites and microorganism inhibitors
- benzene—found in plastics, paints, cleaning agents, and cigarette smoke
- carbon disulfide—found in pesticides
- carbon monoxide—emitted by vehicles, cigarette smoke, welding tools, gasoline-powered tools, cooking stoves, and so forth
- styrene—produced in plastics, fiberglass, and insulating material
- trichloroethylene—found in dry cleaning, spot remover, rug cleaners, paints, waxes, pesticides, and lubricants
- toluene—found in paints, lacquers, adhesives, rubber, leather tanning, spray paint, and many other products

- xylene—found in paints, varnishes, and thinners

Most people use more chemicals at home than at work. Exposure in the workplace is not as common. But, if you are exposed, it is usually higher and more consistent in the workplace. Sometimes, you can be exposed to both loud noises and ototoxic chemicals. Activities include boat building; working in construction; firefighting; fueling vehicles and aircraft; furniture making; manufacturing of metal, leather, and petroleum products; painting; printing; firing of weapons. Be sure to follow all directions to protect yourself.

## What are the effects of chemical exposure on the ear?

Ototoxic chemicals can be eaten, can come in through the skin, or can be breathed in. Once in the blood, they can go to the ear and can be absorbed in different locations of the auditory pathways. These chemicals can also cause hearing loss by damaging the hair cells in the inner ear. When damage occurs, any degree and combination of hearing loss and balance problems are possible.

## What are the symptoms of ototoxic chemical exposure?

Ototoxic chemicals can cause mild to severe hearing loss, or total hearing loss. The hearing loss will be different for each person. The hearing loss depends on various factors, including genetics and noise exposure. You can also have ringing in the ears, called **tinnitus**. These chemicals can also cause balance problems ranging from mild to severe. Some problems will get better; others will stay the same. Some signs of balance problems are as follows:

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- having a headache
- feeling fullness in the ear
- feeling dizzy or lightheaded
- being unsteady when walking, or walking with legs far apart
- having blurry vision or other changes in vision
- having difficulty moving the head
- having problems walking in the dark
- feeling weak

## How do I protect myself?

Knowing about chemicals is a great first step. Here are some more tips that can help if you have to be around ototoxic chemicals.

- Wear a mask or breathing gear. At work, use a ventilation hood if you can.
- Wear gloves.
- Follow safety precautions on all labels.
- Open your windows and doors to allow more air if you need ventilation.
- Stay away from or limit exposure to chemicals you do not know to be safe.
- Have periodic hearing tests for monitoring if you are routinely exposed to loud noise and especially if taking medications that can be harmful to your hearing. Seek an audiologist if you notice changes in your hearing or balance.

Anything that can be harmful to your ears can also harm the rest of your body. By protecting your ears, you may be protecting your health as well.

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For more information and to view the entire Audiology Information Series library, visit [www.asha.org/aud/pei/](http://www.asha.org/aud/pei/).

For more information about balance problems, preventing falls, hearing loss, hearing aids, or referral to an ASHA-certified audiologist, contact:



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