

Chemical Exposure Effects on Hearing and Balance

Ototoxic chemicals

Certain chemicals, like some medicine, have harmful effects on hearing and balance. These are ototoxic chemicals. Ototoxic chemicals can cause hearing loss on their own. The hearing loss can be worse when exposed to both the ototoxic chemicals and loud noises at the same time. Even if noise and chemicals are at recommended exposure levels, exposure to both can do more damage than a higher exposure to just noise or chemicals alone. The hearing frequencies affected by chemical exposure are different than those affected by noise. You can be exposed at work or at home.

Examples of chemicals associated with hearing loss and where they are found

- Arsenic- Parasites and microorganism inhibitors
- Benzene- Found in plastics, paints, cleaning agents, cigarette smoke
- Carbon disulfide- Pesticides
- Carbon monoxide- Vehicles, cigarette smoke, welding, gasoline-powered tools, cooking stoves, clothes dryers, etc.
- Styrene- Produced in plastics, insulating material
- Trichloroethylene- Dry cleaning, spot remover, rug cleaners, paints, waxes, pesticides, and lubricants
- Toluene- Paints, lacquers, adhesives, rubber, leather tanning, spray paint, and many other products
- Xylene- Paints, vanishes, and thinners

Some activities will expose you to both loud noises and ototoxic chemicals. These activities include: boat building, construction, firefighting, fueling vehicles and aircraft, furniture making, manufacturing of metal, leather and petroleum products, painting, printing, weapons firing.

This is not just a work-related problem. In the home, paints, varnishes, pesticides, and cleaning agents may contain these harmful chemicals. Most people use more chemicals at home than at work. These may be harmful to the ear.

Effects of chemical exposure on the ear

Ototoxic chemicals can be eaten, travel through the skin, or breathed into the body. Once in the blood, they can go to the ear and be soaked up by the hearing nerve. This may damage the nerve and cause hearing loss. This can also cause hearing loss by damaging the inner ear hair cells, like the hearing loss caused by noise. When damage occurs, any degree and combination of hearing loss and balance problems are possible. Organic chemicals are the most common cause. Others may also be harmful, such as metals and gases like Helium at higher levels.

What are the symptoms of ototoxic chemical exposure?

Ototoxic chemicals can cause mild to severe hearing loss, or total hearing loss, depending upon each person, and the form and level of exposure. They can also cause ringing in the ears called tinnitus. These chemicals can also cause balance problems ranging from mild to total breakdown. Some signs of balance problems are;

- Headache
- Feeling of fullness in the ear
- Dizziness
- Unable to walk
- Blurry vision or other changes in vision
- Difficultly moving the head
- Walking with legs far apart to make yourself steady
- Problems walking in the dark
- Feeling lightheaded
- Feeling weak

Most of the time, the symptoms slowly go away. If the damage is severe, symptoms such as objects appearing as if they are moving back and forth and problems with walking in the dark or with the eyes closed will not diminish with time.

How do I protect myself?

- Be aware of the problem.
- If you work with these chemicals, use good ventilation, a ventilation hood, a mask, or breathing gear.
- Wear gloves when using chemicals that can soak through the skin.
- Read labels on all household chemicals and other cleaning solutions you use at home. Follow the safety precautions. If the label says use in a ventilated area, open your windows and doors to allow more air.
- Stay away from or limit exposure to chemicals you do not know to be safe.
- Have periodic hearing tests for monitoring when you are around loud noises and especially if taking medications that can be harmful to hearing.

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

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NOTES:



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