



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



Lead

Information For Workers

If you work near products or materials that contain lead, it can get inside your body. If you are exposed to too much lead, it can be toxic. There are ways you can protect yourself and your family from lead, which can cause health problems.

How You Can Be Exposed To Lead

You can be exposed to lead by breathing it in, swallowing it, or absorbing it through your skin.

Breathing lead dust and fumes

- Lead fumes and lead dust do not have an odor and may not be seen in the air, so you may not know you are being exposed.
- Lead fumes are produced during metal processing when metal is heated or soldered. Lead dust is produced when metal is being cut or ground, or when lead paint is sanded or removed with a heat gun. It can also be produced by firing handguns and rifles.
- Your body absorbs higher levels of lead when it is breathed in compared to swallowing it or absorbing it through your skin. Lead fume particles are smaller than lead dust; this means lead fumes can penetrate deeper into your lungs, resulting in higher exposure.

Swallowing lead dust

- Lead dust may not be noticeable. It can settle on food, water, clothes, and other objects.
- If you eat, drink, or smoke in areas where lead is being processed or stored, you could swallow lead dust without knowing. You can also swallow lead dust if you don't wash your hands before you eat or touch your mouth.
- Lead can leave a metallic taste in your mouth, though some people may not notice this.

Absorbing lead through the skin

- Some studies have found that lead can be absorbed through skin.^[1]
- Absorption can also happen if you handle items contaminated with lead and then touch your eyes, nose, or mouth.
- Lead dust on your clothes, shoes, or hair can be hard to notice.

[1] U.S. Department of Health and Human Services [2007] Toxicological profile for Lead (update)

[<http://www.atsdr.cdc.gov/toxprofiles/tp13.pdf>pdf icon (PDF 4.8 MB, 582 pages)] Public Health Service Agency for Toxic Substances and Disease Registry.

Protect Yourself From Lead


If you work with lead, your employer is required to minimize your exposure. There are also ways you can reduce the amount of lead that gets into your body. You can also take steps to keep lead out of your home and car.

When you arrive at work

- Change into work clothes and shoes that stay at your workplace.
 - Store your clean clothes, shoes, and personal items in a closed plastic bag and in a place away from lead.
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When you take breaks or eat

- Always wash your hands with soap designed to remove lead before you eat, drink, or smoke. Washing your skin with standard soap and water is not enough to completely remove lead dust.^[1] Search “lead wipes” in any browser for a list of NIOSH-licensed, commercially available products that are proven to decontaminate your skin.
- Eat, drink, and smoke only in approved places away from lead dust. Do not eat, drink, or smoke in areas where lead-containing products are being handled or processed.
- Never leave your workplace without cleaning up, even if just for a quick trip.

^[1] Filon FL, Boeniger M, Maina G, Adami G, Spinelli P, Damian A. [2006]. Skin absorption of inorganic lead (PbO) and the effect of skin cleansers. Journal of Environmental Medicine. [<http://www.ncbi.nlm.nih.gov/pubmed/16832226> ] 48(7): 692-699.

When you work with lead

- Always follow rules about working safely with lead. Read and follow your employer’s lead control and management plan.
- Clean your work area throughout the day.
- Use wet cleaning methods or a vacuum with a high-efficiency particulate air (HEPA) filter. Never use compressed air or dry sweep.
- Work in areas that are well-ventilated and use local exhaust ventilation where provided. Open windows or work outside when possible to improve airflow.
- Always wear required personal protective equipment (PPE) correctly. PPE, such as goggles, gloves, boots, and other protective clothing, prevent contact while working around lead. In some cases, you may need to wear a respirator. Talk with a health and safety or union representative from your worksite or call 800-CDC-INFO (800-232-4636) to learn more.
- Clean re-usable PPE (e.g., goggles, boots) with a lead-removing wipe or solution daily. Replace items that become excessively soiled (e.g., work gloves).
- Avoid touching your face and mouth.
- Wash your hands with soap designed to remove lead as soon as you can after working with lead or cleaning your work area.

When you are leaving work

- Don't take home tools, scrap, and packaging that may have lead on them.
- Always shower and wash your hair before leaving work.

If you can't shower at work

- Wash as much of your skin as you can with lead-removal soap before going home.
- Change clothes and shoes before going home and leave dirty clothes and shoes at work for cleaning.

If your workplace doesn't clean your work clothes


- Store work clothes in a closed plastic bag away from all other clothes.
- Wash and dry work clothes alone and not with any other clothes.

Check Lead Levels in Your Blood

Talk with your employer to see if they do routine Blood Lead Level (BLL) testing. The BLL test is a simple blood test that measures the amount of lead in your blood. If your employer does not do routine BLL testing, talk with your healthcare provider about having this test done. If your blood levels are high, you can take steps to [protect yourself and your family and household](#).

If you are breastfeeding, consult your baby's pediatrician to decide if you should have a BLL test. Ask them to help you understand your BLL test results.

Share Your Concerns

- If you are concerned that you are being exposed to lead or another workplace hazard, contact the [NIOSH Health Hazard Evaluation Program](#) and [submit a request](#) to have your work environment evaluated for free.
- If you are concerned about unsafe working conditions, [contact the OSHA office nearest you](#) .

Protect Your Family And Household From Work-related Lead

If your workplace contains lead, you may be bringing it home to your family and household. Lead poisoning has occurred in children whose parents accidentally brought home lead dust on their clothing, shoes, and in their cars. Lead dust on your clothing or belongings can be swallowed, touched, or breathed in by those who live with you. You may also be tracking lead dust into your vehicle; if it is contaminated with lead from work, anyone who rides in it will be exposed.

Don't take lead home with you! It's easier to keep lead out of your home or car than to clean them. Cleaning up lead is hard and can be expensive.

Before work

- Anything you take to work can get lead on it.
- Bring as little as possible to work.
- Consider bringing food and water in disposable containers.

At home

- Never wear shoes in your home that you wore at work. Take off work shoes outside the home and store them in a closed plastic bag.
- If you can't shower at work, shower as soon as you get home.
- Clean your vehicle and your home often. For hard floors and furniture, use wet cleaning methods. For carpets and fabrics, use a vacuum cleaner with a HEPA filter.
- When cleaning up lead, use separate cleaning supplies than you use in the rest of the home. This will keep lead from spreading throughout your home.

At the healthcare provider's office

- If your work doesn't test your blood for lead, tell your healthcare provider you work with lead and ask if you should be tested.
- Make sure *everyone in your household* tells their healthcare provider they live with someone who works with lead. Healthcare providers especially need to know if you are pregnant or trying to become pregnant, and if children live or spend time in your household.

Health Problems Caused By Lead

Your body does not need lead to survive. If lead gets inside your body, it can cause many health problems. No safe level of lead has been identified.

If you work near products or materials that contain lead, it can get inside your body. If you are exposed to too much lead, it can be toxic.

Health effects from short-term, high exposure to lead



Lead poisonings can happen if you are exposed to **high levels of lead over a short time period** (also called an acute exposure). When this happens, you may experience:

- Metallic taste
- Abdominal pain, nausea, vomiting
- Diarrhea or constipation
- Dehydration, headache, exhaustion, irritability, weakness
- Appetite loss
- Memory loss
- Pain or tingling in your hands or feet

Symptoms may occur slowly, so health professions may overlook lead poisoning as the cause as other things can also cause many of these symptoms.

Exposure to high levels of lead may cause:

- Anemia

- Kidney and brain damage
- Death

Health effects from chronic exposures

A person who is exposed to lead over **long periods of time** may experience:

- Abdominal pain, nausea, and constipation
- Depression, irritability, and altered moods or behaviors
- Distraction and forgetfulness
- Increased blood pressure

Other symptoms include:

- Decreased lung function
- Bone or tooth loss
- Increased infections in general
- Fertility problems in both men and women

The following agencies have determined lead is probably cancer-causing in humans:

- Department of Health and Human Services [\[1\]](#)
- Environmental Protection Agency [\[2\]](#)
- International Agency for Research on Cancer [\[3\]](#)

[\[1\] Lead | Toxicological Profile | ATSDR \(cdc.gov\)](#)

[\[2\] Lead and compounds \(inorganic\) CASRN 7439-92-1 | DTXSID2024161 | IRIS | US EPA, ORD !\[\]\(8bba887393ca45b761e5cb49e755e762_img.jpg\)](#)

[\[3\] IARC Publications Website – Inorganic and Organic Lead Compounds !\[\]\(6bb0e4f14c4133b37d2887cb37e67ddd_img.jpg\)](#)

Signs that children may be experiencing lead exposure

Children tend to show signs of severe lead toxicity at lower exposure levels than adults. However, most children with lead in their blood have no obvious symptoms. A blood test is the easiest way to determine if a child has been exposed to lead. Talk to your child's healthcare provider about getting a [blood lead test](#).[\[1\]](#)

Exposure to lead can seriously harm a child's health and can cause:[\[2\]](#)

- Damage to the brain and nervous system
- Slowed growth and development
- Learning and behavior problems
- Hearing and speech problems

Lead can cross the placental barrier, which means pregnant women who are exposed to lead may also expose their unborn child. Lead can damage a developing baby's nervous system. It can also cause miscarriage, stillbirths, and infertility in both men and women. [Learn more about how lead affects children on the CDC webpage.](#)

[1] <https://www.cdc.gov/nceh/lead/prevention/default.htm>

[2] <https://www.cdc.gov/nceh/lead/prevention/health-effects.htm>

What happens when lead gets inside our bodies



The health effects of lead are the same whether lead particles are breathed in, swallowed, or absorbed through your skin. However, our bodies absorb higher levels of lead when it is breathed in.

The human body stores lead in our blood and other tissues, however, in adults over 90% of lead is stored in our bones. As we age, our bones often weaken and become less dense. Aging often moves minerals out of bone and into other areas of our body. Lead stored in our bone, sometimes for decades, may then be released into our blood. If this happens, lead can reach and possibly harm other organ systems in our body. Many women undergoing menopause experience these changes; post-menopausal women have been found to have higher blood lead levels (BLLs) than pre-menopausal women.

Lead can impact nerve function in our body. Our body's sensory systems rely heavily on healthy nerves. Nerves are essential for detecting signals in the environment and acting in response to change. Lead exposure has been found to impact the auditory or hearing system. Some scientists think exposures to lead AND noise together can damage hearing to an even greater degree than hearing loss caused by loud noise exposures alone.