



# Lead

## Agency for Toxic Substances and Disease Registry

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*This fact sheet answers the most frequently asked health questions about lead. For more information, you may call the ATSDR Information Center at 1-800-447-1544. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.*

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**SUMMARY:** Exposure to lead happens mostly from breathing workplace air or dust, and eating contaminated foods. Children can be exposed from eating lead-based paint chips, or playing in contaminated soil. Lead can damage the nervous system, kidneys, and the immune systems. Lead has been found in at least 922 of 1,300 National Priorities List sites identified by the Environmental Protection Agency.

### **What is lead? (Pronounced led)**

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. It has no special taste or smell. Lead can be found in all parts of our environment. Most of it came from human activities like mining, manufacturing, and the burning of fossil fuels.

Lead has many different uses, most importantly in the production of batteries. Lead is also in ammunition, metal products (solder and pipes), roofing, and devices to shield x-rays.

Because of health concerns, lead from gasoline, paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years.

### **What happens to lead when it enters the environment?**

- Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- When released to the air from industry or burning of fossil fuels or waste, it stays in air about 10 days.
- Most of the lead in soil comes from particles falling out of the air.
- City soils also contain lead from landfills and leaded paint.
- Lead sticks to soil particles.

- It does not move from soil to underground water or drinking water unless the water is acidic or "soft".
- It stays a long time in both soil and water.

### **How might I be exposed to lead?**

- Breathing workplace air (lead smelting, refining, and manufacturing industries)
- Eating lead-based paint chips
- Drinking water that comes from lead pipes or lead soldered fittings
- Breathing or ingesting contaminated soil, dust, air, or water near waste sites
- Breathing tobacco smoke
- Eating contaminated food grown on soil containing lead or food covered with lead-containing dust
- Breathing fumes or ingesting lead from hobbies that use lead (leaded-glass, ceramics)

### **How can lead affect my health?**

Lead can affect almost every organ and system in your body. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the immune system. The effects are the same whether it is breathed or swallowed.

Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common after exposure to **high levels** of lead.

In adults, lead may decrease reaction time, cause weakness in fingers, wrists, or ankles, and possibly affect the memory. Lead may cause anemia, a disorder of the blood. It can cause abortion and damage the male reproductive system. The connection between these effects and exposure to **low levels** of lead is uncertain.

### **How likely is lead to cause cancer?**

The Department of Health and Human Services (DHHS) has determined that lead acetate and lead phosphate may reasonably be anticipated to be carcinogens based on studies in animals. There is inadequate evidence to clearly determine lead's carcinogenicity in humans.

### **Is there a medical test to show whether I've been exposed to lead?**

A blood test is available to measure the amount of lead in your blood and to estimate the amount of your exposure to lead. Blood tests are commonly used to screen children for potential chronic lead poisoning. The Centers for Disease Control and Prevention (CDC) considers children to have an elevated level of lead if the amount in the blood is at least 10 micrograms per deciliter (10 µg/dL). Lead in teeth and bones can be measured with X-rays, but this test is not as readily available.

**Has the federal government made recommendations to protect human health?**

**The Centers for Disease Control and Prevention (CDC)** recommends all children be screened for lead poisoning at least once a year. This is especially important for children between 6 months and 6 years old.

**The Environmental Protection Agency (EPA)** requires lead in air not to exceed 1.5 micrograms per cubic meter ( $1.5 \mu\text{g}/\text{m}^3$ ) averaged over 3 months. The sale of leaded gasoline will be illegal as of December 31, 1995. EPA limits lead in drinking water to 15 micrograms per liter ( $15 \mu\text{g}/\text{L}$ ).

**The Consumer Product Safety Commission (CPSC)**, EPA, and the states control the levels of lead in drinking water coolers. Water coolers that release lead must be recalled or repaired. New coolers must be lead-free. Drinking water in schools must be tested for lead.

**The Department of Housing and Urban Development (HUD)** requires that federally funded housing and renovations, public housing, and Indian housing be tested for lead-based paint hazards. Hazards must be fixed by covering the paint or removing it.

**The Occupational Safety and Health Administration (OSHA)** limits the concentration of lead in workroom air to  $50 \mu\text{g}/\text{cubic meter}$  for an 8-hour workday. If a worker has a blood lead level of  $40 \mu\text{g}/\text{dL}$ , OSHA requires that worker to be removed from the workroom.

**Where can I get more information?**

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

**For more information, contact:**

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