



Bureau of Environmental Health and Radiation Protection

"Protect and improve the health of all Ohioans by preventing disease, promoting good health and assuring access to quality care."

Lead Contamination in Gardens

Answers to Frequently Asked Health Questions

What is lead?

Lead is a naturally occurring bluish-gray metal found in the earth's crust. Prior to our current knowledge of the health hazards of lead, it was widely used in products such as gasoline, paints, batteries, metal products and ammunition- just to name a few.

Because lead is toxic, its use in the U.S. has been dramatically reduced since the 1980's.

Lead in the environment:

Lead does not break down in the environment. Once lead falls on to soil, it usually sticks to the soil particles and remains a long-term source of lead exposure. If the soil is uncovered and open to the air or becomes disturbed, lead-contaminated dust can be created. This dust can be easily breathed in or swallowed.

The possibility of dust being created at a lead-contaminated site is an important public health concern. Activities such as construction, where you are moving dirt and disturbing large areas, are very concerning because construction sites often create a lot of dust.



Other activities such as gardening also disturb and expose soils and may create small amounts of dust. But more importantly, some garden vegetables grown in lead- contaminated soils may contain lead. Certain vegetables (especially root vegetables such as beets, carrots, turnips, radishes, potatoes and rutabagas) easily absorb (uptake) some of the lead through their roots. There is also the possibility of

lead- contaminated dust falling onto crops such as lettuce, spinach or other leafy vegetables.

How does lead get in your body?

You may be exposed to lead by breathing (inhalation), eating/drinking (ingestion) or by skin contact (dermal contact). However, only very small amounts of lead can get into your body through dermal contact.

Inhalation and ingestion of lead-contaminated dust and soil are the main health concerns.

How does lead affect your health?

The harmful effects of lead are the same whether it is breathed or swallowed. The main target for lead toxicity is the body's nervous system, including the brain. But lead can harm every organ of the body.

Children are most vulnerable to lead poisoning because they play outside, close to the ground or in the dirt. Small children also put their fingers in their mouths. Compared to adults, a bigger proportion of the amount of lead swallowed will enter the blood in children. About 99% of the amount of lead taken into the body of an adult will leave in the waste within a couple of weeks. But only about 32% of the lead taken into the body of a child will leave in the waste.

Lead exposure in the womb, in infancy or in early childhood may also slow mental development and lower intelligence later in childhood. Lead can cause irritability and aggressive behavior in children. If pregnant women have high levels of lead in their bodies, fetuses exposed to lead in the womb may be born prematurely and have lower weights at birth. In some cases, pregnant

women with high levels of exposure to lead may have miscarriages.

Some other harmful health effects of lead include damaged kidneys, damaged male reproductive system, severe "stomachaches," a poor appetite, sleep disorders and hearing problems. Lead can also decrease reaction time and affect the memory.

Is there a medical test to determine whether I have been exposed to lead?

Yes, there is a test to see if you have been exposed to lead. The primary screening method is the measurement of "total lead" in the blood. This test can tell if you have been recently exposed to lead.



Lead can also be measured in teeth or bones by using X-ray techniques. These tests can tell about long-term exposure but are not widely available.

How can families reduce their exposure to lead?

One important way a family can lower their exposure to lead is to avoid exposure to lead-contaminated soil and dust sources. The swallowing of lead-contaminated soil or dust is a very important exposure pathway for children and gardeners.

Helpful hints:

- Washing your hands to remove lead dust and soil, especially before meals, can lower the possibility that lead on the skin is accidentally swallowed while eating.
- Families can lower exposures to lead by regularly cleaning the home of dust and tracked-in soil.
- Door mats can help lower the amount of soil that is tracked into the home and removing your shoes before you enter the house will also help.
- Covering bare soil with clean sand, wood chips, gravel or grass can lower contact that children and pets may have with soil

- and the tracking of soil into the home.
- Bag gardening-work clothes before they are brought into the home for cleaning.
- Immediately wash your hands or shower after working with lead-contaminated soils.

It is important that children have proper nutrition and eat a balanced diet of foods that supply adequate amounts of vitamins and minerals, especially a diet high in calcium and iron. Good nutrition lowers the amount of swallowed lead that passes to the bloodstream and also may reduce some of the toxic effects of lead.

Good Gardening Practices:

- Plant gardens away from roads, driveways and old painted structures that may contain lead-based paints.
- Protect gardens against air-borne lead by erecting a fence or plant a hedge between your garden and bare soils.
- Grow crops in raised beds or containers with lead-free soil.
- Estimate the amount of soil in your garden and mix one-third the total volume of soil with organic material such as peat moss, compost and manure. Organic mulch worked into soil, especially fresh manure, binds the lead so it is not available to be taken up by plants.
Note: Avoid the use of bone meal.
- Plant fruiting crops such as tomatoes, peppers, squash, cucumbers, peas, beans, corn, melons, strawberries, etc.
- Limit planting leafy vegetables such as lettuce, spinach or greens. Avoid planting root crops such as carrots, beets, turnips, potatoes and radishes. If you grow leafy vegetables, discard old and outer leaves of the vegetable and scrub and peel any root crops before eating. **DO NOT** compost these materials!
- Wash vegetables with 1% vinegar in water solution (1 - 2 ounces vinegar per gallon of water). Use a stiff brush to scrub vegetables before eating.

- Lime the soil as recommended by your soil test to obtain a pH of 6.5. Lime can be found at farm and garden supplies stores.

If you are worried about gardening in lead- contaminated soils, bring in lead-free soil, install raised beds, try container gardening and/or mix the soil with organic material. Fresh fruits and vegetables not only taste good, they are good for you. You don't have to stop gardening!

References:

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological profile for lead.

Ohio Department of Health Childhood Lead Poisoning Prevention Program
Phone: (877) 668-5323 or (614) 466-1450

The Ohio State University Cooperative Extension HYG-1149-93

Where Can I Get More Information?

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This fact sheet was developed in cooperation with the Agency for Toxic Substances and Disease Registry