

Lead In Water Supply Pipes

By Keith L. Phillips

Exposure to lead in the home occurs primarily via two ways: the ingestion and/or inhalation of lead dust from paint and the consumption of water contaminated with lead. This article addresses issues concerning lead pipes and lead in drinking water.

Water contamination

Lead-contaminated drinking water is most often a problem in homes that are either very old or very new. Up through the early 1900s, it was common practice to use lead pipes for interior plumbing. Also lead piping was often used for the service connections that join residences to public water supplies. Copper pipes have replaced lead pipes in most residential plumbing. However, the use of lead solder with copper pipes is widespread. Experts regard this lead solder as the major cause of lead contamination of household water in U.S. homes today. Lead concentrations in drinking water can be also be elevated if your home has faucets or fittings of brass which contains some lead. The most common cause of lead getting into drinking water is corrosion, a reaction between the water and the lead pipes or lead solder. Lead can leach into the water from the joints or from lead pipes. Dissolved oxygen, low pH (acidity), and low mineral content in water are common causes of corrosion. One factor that increases corrosion is the practice of grounding electrical equipment, {such as telephones} to water pipes. Any electric current traveling through the ground wire will accelerate the corrosion of lead in the pipes. Most well and city water does not usually contain lead. Water can pick up lead inside the home from household plumbing that is made with lead materials. The only way to know if there is lead in drinking water is to have it tested. If home owners are concerned about their drinking water they should contact **Department of Community Health - State Labs (517 - 335-8244) in Lansing** or the water supplier to find out how to get the water tested in their home. The testing will cost the home owner a nominal fee. There are also several private labs that can do lead testing. Home owners can also call the **National Lead Information Central 1-800-424-5323**

New brass faucets and fittings can also leach lead, even though they are “lead-free”. Scientific data indicate that the newer the home, the greater the risk of lead contamination. Lead concentrations decrease as the building ages. This is because, as time passes, mineral deposits form a coating on the inside of the pipes (if the water is not corrosive). This coating insulates the water from the solder. But, during the first five years, before the coating forms, water is in direct contact with the lead. More likely than not, water in buildings less than five years old has high concentrations of lead contamination.

Because of similar chemical properties, the body confuses lead with calcium when ingested and incorporates it into the bone marrow, nerve tissue, brain, and kidneys. The body never decomposes the lead into another, more easily tolerated substance, because lead is an element.

In children, symptoms of lead poisoning can include headaches, irritability, abdominal pain, vomiting, anemia, weight loss, poor attention span, noticeable learning difficulty, slowed speech development, and hyperactivity. In adults, symptoms of lead poisoning can include pain, numbness or tingling of the extremities, muscular weakness, headache, abdominal pain, memory loss, unsteady gait, pale skin, weight loss, vomiting, irritability, and anemia. Although adults are susceptible to the toxic effects of lead, children are at high risk due to the nature of a child's activities that involve the introduction of non-food items into their bodies. Lead poisoning is one of the most common preventable public health problems related to children today. At low concentration lead can adversely affect the brain, the central nervous system, blood cells, and kidneys. Blood lead concentrations as low as 10 ug/dl can impair mental and physical development. Lead at high concentrations (80 ug/dl or above) can cause convulsions, coma, and death. The effects of lead exposure on unborn and young children can be severe. The effects of lead poisoning in children include reading and learning disabilities, delays in physical and mental development, shortened attention span, speech and language handicaps, lowered IQ, neurological deficits, behavior problems, mental retardation, kidney disease, heart disease, stroke, and death. Children are more vulnerable to lead exposure than adults since lead is more easily absorbed into growing bodies, and the tissues of small children are more sensitive to the damaging effects of lead. Children may have higher exposures since they are more likely to get lead dust on their hands and then put their fingers or other lead-contaminated objects into their mouths. If you suspect lead poisoning, consult your physician immediately.

There are ways to reduce your exposure to lead in **Water**:

Have your home inspected for lead piping. If you suspect your water contains lead have it tested by a qualified laboratory. Lead piping should be removed. Flush your pipes before drinking. Anytime the water in a particular faucet has not been used for six hours or longer, flush your cold water pipes by running water until it becomes as cold as it will get. The more time water has been sitting in your home's pipes, the more lead it may contain.

National Center for Environmental Health- Lead in Water FAQ

Lead in Water: Questions and Answers

How does lead get into my tap water?

Measures taken during the last two decades have greatly reduced exposures to lead in tap water. These measures include actions taken under the requirements of the 1986 and 1996 amendments to the Safe Drinking Water Act (<http://www.epa.gov/safewater/sdwa/sdwa.html>) and the EPA's Lead and Copper Rule (<http://www.epa.gov/safewater/leadcop.html>).

Even so, lead still can be found in some metal water taps, interior water pipes, or pipes connecting a house to the main water pipe in the street. Lead found in tap water usually comes from the corrosion of older fixtures or from the solder that connects pipes. When water sits in leaded pipes for several hours, lead can leach into the water supply.

How do I know if my tap water is contaminated with lead?

The only way to know whether your tap water contains lead is to have it tested. You cannot see, taste, or smell lead in drinking water. Therefore, you must ask your water provider whether your water has lead in it. For homes served by public water systems, data on lead in tap water may be available on the Internet from your local water authority. If your water provider does not post this information, you should call and find out.

Does a high lead level in my tap water cause health effects?

High levels of lead in tap water can cause health effects if the lead in the water enters the bloodstream and causes an elevated blood lead level.

Most studies show that exposure to lead-contaminated water alone would not be likely to elevate blood lead levels in most adults, even exposure to water with a lead content close to the Environmental Protection Agency's (EPA's) "action level for lead of 15 parts per billion (ppb). Risk will vary, however, depending upon the individual, the circumstances, and the amount of water consumed. For example, infants who drink formula prepared with lead-contaminated water may be at a higher risk because of the large volume of water they consume relative to their body size.

What can I do to reduce or eliminate lead in my tap water?

If your tap water contains lead at levels exceeding EPA's action level of **15 parts per billion (ppb)**, you should take action to minimize your exposure to the lead in the water.

You should begin by asking your water authority this question:

1. Does my water have lead in it above EPA's "action level of 15 parts per billion (ppb)?"

If the answer is no, your water does not contain lead at current levels of concern.

If the answer is "yes, also ask the next question:

2. Does the service pipe at the street ("header pipe") have lead in it?

This information is very important. It determines which of the next two actions (A or B) you should follow to protect your household's health.

- A) If the pipe in the street "header pipe" does **NOT** have lead, the lead in your tap water may be coming from fixtures, pipes, or elsewhere inside your home.

Until you eliminate the source, you should take the following steps any time you wish to use tap water for drinking or cooking, especially when the water has been off and sitting in the pipes for more than 6 hours:

- a. Before using any tap water for drinking or cooking, "flush your water system by running the kitchen tap (or any other tap you take drinking or cooking water from) on COLD for 1 minute;
- b. Then, fill a clean container(s) with water from this tap. This water will be suitable for drinking, cooking, preparation of baby formula, or other consumption. To

conserve water, collect multiple containers of water at once (after you have fully flushed the water from the tap as described).

- B) If the pipe at the street “header pipe” **DOES contain lead**, lead in the tap water may be coming from that pipe or connected pipes (it may also be coming from sources inside your home).

Until the lead source is eliminated, you should take the following steps any time you wish to use tap water for drinking or cooking, especially when the water has been off and sitting in the pipes for more than 6 hours. Please note that additional “flushing is necessary:

- a. Before using any tap water for drinking or cooking, run high-volume taps (such as your shower) on COLD for 5 minutes or more;
 - b. Then, run the kitchen tap on COLD for 1 additional minute;
 - c. Fill a clean container(s) with water from this tap. This water will be suitable for drinking, cooking, preparation of baby formula, or other consumption. To conserve water, collect multiple containers of water at once (after you have fully flushed the water from the tap as described).
3. In all situations, drink or cook only with water that comes out of the tap cold. Water that comes out of the tap warm or hot can contain much higher levels of lead. Boiling this water **will NOT** reduce the amount of lead in your water.
 4. You can also reduce or eliminate your exposure to lead in drinking water by consuming only bottled water or water from a filtration system that has been certified by an independent testing organization to reduce or eliminate lead. See resources below.
 5. Children and pregnant women are especially vulnerable to the effects of lead exposure. Therefore, for homes with children or pregnant women and with water lead levels exceeding EPA’s action level of 15 ppb, CDC recommends using only bottled water for cooking, drinking, and baby formula preparation. Because most bottled water does not contain fluoride, a fluoride supplement may be necessary.

Also, be aware that some bottled waters have not been tested and may not be appropriate for consumption. Contact independent testing organizations that certify bottled water. See resources below.

6. Be sure that any planned repairs made to copper pipes do not include the use of lead solder.

If my water has high lead levels, is it safe to take a bath or shower?

Yes, bathing and showering should be safe for you and your children, even if the water contains lead over EPA’s action level. Human skin does not absorb lead in water.

This information applies to most situations and to a large majority of the population, but individual circumstances may vary. Some situations, such as cases involving highly corrosive water, may require additional recommendations or more stringent actions. At all times, your local water authority remains your first source for testing and identifying lead contamination in your tap water. Many public water authorities have Web sites that include data on drinking water quality, including results of lead testing. Links to such data can be found at the following EPA Web site: <http://www.epa.gov/safewater/dwinfo.htm>.

Other Resources

Lead in Drinking Water

This site includes comprehensive information on lead in drinking water. Safe Drinking Water Hotline: 1-800-426-4791.

Bottled Water and Water Filters:

NSF International

A nonprofit organization that certifies bottled water and water filters. Consumer Affairs Office toll-free hotline: 1-877-867-3435.

International Bottled Water Association

The trade association that represents the bottled water industry. Information Hotline: 1-800-WATER-11.