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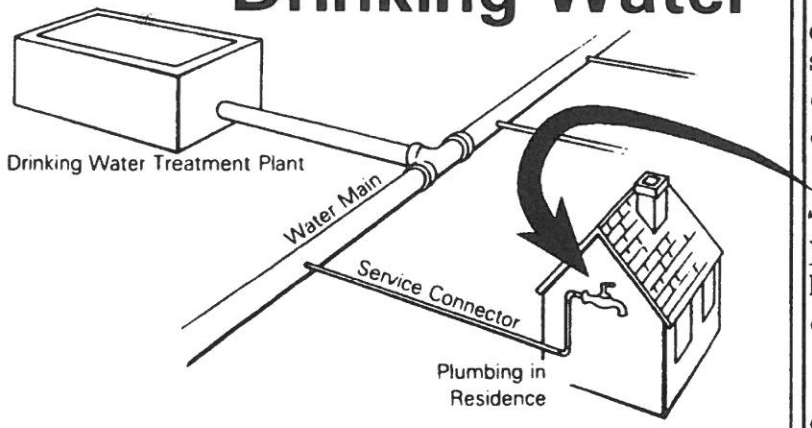
LEAD In Your Drinking Water



Health Threats From Lead

Too much lead in the human body can cause serious damage to the brain, kidneys, nervous system, and red blood cells.

You have the greatest risk, even with short-term exposure, if:

- you are a young child, or
- you are pregnant.

Sources of Lead in Drinking Water

Lead levels in your drinking water are likely to be highest if:

- your home has faucets or fittings made of brass which contains some lead, **or**
- your home or water system has lead pipes, **or**
- your home has copper pipes with lead solder, **and**
  - the home is less than five years old, or
  - you have natually soft water, or
  - water often sits in the pipes for several hours.

Actions You Can Take To Reduce Lead In Drinking Water

- **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 the water until it becomes as cold as it will get. (This could take as little as five to thirty seconds if there has been recent heavy water use such as showering or toilet flushing. Otherwise, it could take two minutes or longer.) The more time water has been sitting in your home's pipes, the more lead it may contain.

- **Only Use Cold Water for Consumption**

Use *only* water from the cold-water tap for drinking, cooking, and **especially for making baby formula.** Hot water is likely to contain higher levels of lead.

The two actions recommended above are very important to the health of your family. They will probably be effective in reducing lead levels because most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.

- **Have Your Water Tested**

After you have taken the two precautions above for reducing the lead in water used for drinking or cooking, **have your water tested.** The only way to be sure of the amount of lead in your household water is to have it tested by a competent laboratory. Your water supplier may be able to offer information or assistance with testing. Testing is especially important for apartment dwellers, because flushing may not be effective in high-rise buildings with lead-soldered central piping.

For more details on the problem of lead in drinking water and what you can do about it, read the questions and answers in the remainder of this booklet. *Your local or state department of health or environment might be able to provide additional information.*

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Q Why is lead a problem?

A Although it has been used in numerous consumer products, lead is a toxic metal now known to be harmful to human health if inhaled or ingested. Important sources of lead exposure include: ambient air, soil and dust (both inside and outside the home), food (which can be contaminated by lead in the air or in food containers), and water (from the corrosion of plumbing). On average, it is estimated that lead in drinking water contributes between 10 and 20 percent of total lead exposure in young children. In the last few years, federal controls on lead in gasoline have significantly reduced people's exposure to lead.

The degree of harm depends upon the level of exposure (from all sources). Known effects of exposure to lead range from subtle biochemical changes at low levels of exposure, to severe neurological and toxic effects or even death at extremely high levels.

Q Does lead affect everyone equally?

A Young children, infants and fetuses appear to be particularly vulnerable to lead poisoning. A dose of lead that would have little effect on an adult can have a big effect on a small body. Also, growing children will more rapidly adsorb any lead they consume. A child's mental and physical development can be irreversibly stunted by over-exposure to lead. In infants, whose diet consists of liquids made with water - such as baby formula - lead in drinking water makes up an even greater proportion of total lead exposure (40 to 60 percent).

Q How could lead get into my drinking water?

A Typically, lead gets into your water after the water leaves your local treatment plant or your well. That is, the source of lead in your home's water is most likely pipe or solder in your home's own plumbing.

The most common cause is corrosion, a reaction between the water and the lead pipes or solder. Dissolved oxygen, low pH (acidity) and low mineral content in water are common causes of corrosion. All kinds of water, however, may have high levels of lead.

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. (Nevertheless, wires **should not be removed** from pipes unless a qualified electrician installs an adequate alternative grounding system.)

Q Does my home's age make a difference?

A Lead-contaminated drinking water is most often a problem in houses that are either very old or very new.

Up through the early 1900's, it was common practice, in some areas of the country, to use lead pipes for interior plumbing. Also, lead piping was often used for the service connections that join residences to public water supplies. (This practice ended only recently in some localities.) Plumbing installed before 1930 is most likely to contain lead. 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. 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 levels decrease as a 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 levels of lead contamination.**

Q How can I tell if my water contains too much lead?

A You should have your water tested for lead. Testing costs between $20 and $100. Since you cannot see, taste, or smell lead dissolved in water, testing is the only sure way of telling whether or not there are harmful quantities of lead in your drinking water.

You should be particularly suspicious if your home has lead pipes (lead is a dull gray metal that is soft enough to be easily scratched with a house key), if you see signs of corrosion (frequent leaks, rust-colored water, stained dishes or laundry, or if your non-plastic plumbing is less than five years old. Your water supplier may have useful information, including whether or not the service connector used in your home or area is made of lead.

Testing is especially important in high-rise buildings where flushing might not work.

Q How do I have my water tested?

A Water samples from the tap will have to be collected and sent to a qualified laboratory for analysis. Contact your local water utility or your local health department for information and assistance. In some instances, these authorities will test your tap water for you, or they can refer you to a qualified laboratory. You may find a qualified testing company under 'Laboratories" in the yellow pages of your telephone directory.

You should be sure that the lab you use has been approved by your state or by EPA as being able to analyze drinking water samples for lead contamination. To find out which labs are qualified, contact your state or local department of the environment or health.

Q What are the testing procedures?

A Arrangements for sample collection will vary. A few laboratories will send a trained technician to take the samples; but in most cases, the lab will provide sample containers along with instructions as to how you should draw your own tap-water samples. If you collect the samples yourself, make sure you follow the lab's instructions exactly. Otherwise, the results might not be reliable.

Make sure that the laboratory is following EPA's water sampling and analysis procedures. Be certain to take a "first draw" and a "fully flushed" sample. (The first-draw sample - taken after at least six hours of no water use from the tap tested - will have the highest level of lead, while the fully

flushed sample will indicate the effectiveness of flushing the tap before using the water.)

Q How much lead is too much?

A Federal standards initially limited the amount of lead in water to 50 parts per billion (ppb). In light of new health and exposure data, EPA has set an action level of 15 ppb. If tests show that the level of lead in your household water is in the area of 15 ppb or higher, it is advisable - especially if there are young children in the home - to reduce the lead level in your tap water as much as possible. (EPA estimates that more than 40 million U.S. residents use water that can contain lead in excess of 15 ppb.)

Note: One ppb is equal to 1.0 microgram per liter (µg/l) or 0.001 milligram per liter (mg/l).

Q How can I reduce my exposure?

A If your drinking water is contaminated with lead-or until you find out for sure-there are several things you can do to minimize your exposure. Two of these actions should be taken right away by everyone who has, or suspects, a problem. The advisability of other actions listed here will depend upon your particular circumstances.

Immediate Steps

- The first step is to refrain from consuming water that has been in contact with your home's plumbing for more than six hours, such as overnight or during your work day. Before using water for drinking or cooking, "flush" the cold water faucet by allowing the water to run until you can feel that the water has become as cold as it will get. You must do this for each drinking water faucet-taking a shower will not flush your kitchen tap. Buildings built prior to about 1930 may have service connectors made of lead. Letting the water run for an extra 15 seconds after it cools should also flush this service connector. Flushing is important because the longer water is exposed to lead pipes or lead solder, the greater the possible lead contamination. (The water that comes out after flushing will not have been in extended contact with lead pipes or solder.)

Once you have flushed a tap, you might fill one or more bottles with water and put them in the refrigerator for later use that day. (The water that was flushed - usually one to two gallons-can be used for non-consumption purposes such as washing dishes or clothes; it needn't be wasted.)

Note: Flushing may prove ineffective in high-rise buildings that have large-diameter supply pipes joined with lead solder.

- The second step is to never cook with or consume water from the hot-water tap. Hot water dissolves more lead more quickly than cold water. So, do not use water taken from the hot tap for cooking or drinking, and **especially not for making baby formula.** (If you need hot water, draw water from the cold tap and heat it on the stove.) Use only thoroughly flushed water from the cold tap for any consumption.

Definitions

Corrosion: A dissolving and wearing away of metal caused by a chemical reaction (in this case, between water and metal pipes, or between two different metals).

First Draw: The water that immediately comes out when a tap is first opened.

Flush: To open a cold-water tap to clear out all the water which may have been sitting for a long time in the pipes. In new homes, to flush a system means to send large volumes of water gushing through the unused pipes to remove loose particles of solder and flux. (Sometimes this is not done correctly or at all.)

Flux: A substance applied during soldering to facilitate the flow of solder. Flux often contains lead and can, itself, be a source of contamination.

Naturally soft water: Any water with low mineral content, lacking the hardness minerals calcium and magnesium.

Public Water System: Any system that supplies water to 25 or more people or has 15 or more service connections (buildings or customers).

Service Connector: The pipe that carries tap water from the public water main to a building. In the past these were often made of lead.

Soft water: Any water that is not "hard." Water is considered to be hard when it contains a large amount of dissolved minerals, such as salts containing calcium or magnesium. You may be familiar with hard water that interferes with the lathering action of soap.

Solder: A metallic compound used to seal joints in plumbing. Until recently, most solder contained about 50 percent lead.

Other Actions

- If you are served by a public water system (more than 219 million people are) contact your supplier and ask whether or not the supply system contains lead piping, and whether your water is corrosive. If either answer is yes, ask what steps the supplier is taking to deal with the problem of lead contamination.

Drinking water can be treated at the plant to make it less corrosive. Cities such as Boston and Seattle have successfully done this for an annual cost of less than one dollar per person. (Treatment to reduce corrosion will also save you and the water supplier money by reducing damage to plumbing.)

Water mains containing lead pipes can be replaced, as well as those portions of lead service connections that are under the jurisdiction of the supplier.

- If you own a well or another water source, you can treat the water to make it less corrosive. Corrosion control devices for individual households include calcite filters and other devices. Calcite filters should be installed in the line between the water source and any lead service connections or lead-soldered pipe. You might ask your health or water department for assistance in finding these commercially, available products.

- Recently a number of cartridge type filtering devices became available on the market. These devices use various types of filtering media, including carbon, ion exchange resins, activated alumina and other privately marketed products. Unless they have been certified as described below, the effectiveness of these devices to reduce lead exposure at the tap can vary greatly.

It is highly recommended that before purchasing a filter, you verify the claims made by the vendor. If you have bought a filter, you should replace the filter periodically as specified by the manufacturer. Failure to do so may result in exposure to high lead levels.

Two organizations can help you decide which type of filter is best for you. The National Sanitation Foundation, International (NSF), and independent testing agency, evaluates and certifies the performance of filtering devices to remove lead from drinking water. Generally, their seal of approval appears on the device and product packaging. The Water Quality Association (WQA) is an independent, not-for-profit organization that represents firms and individuals who produce and sell equipment and services which improves the quality of drinking water. WQA's water quality specialists can provide advice on treatment units for specific uses at home or business.

For additional information regarding the certification program, contact NSF at (313) 769-8010, or WQA at (708) 505-0161, ext. 270.

- You can purchase bottled water for home and office consumption. (Bottled water sold in interstate commerce is regulated by the Food and Drug Administration. Water that is bottled and sold within a state is under state regulation. EPA does not regulate bottled water.)

- When repairing or installing new plumbing in old homes, instruct, in writing, any plumber you hire to use only lead-free materials.

- When building a new home, be sure lead-free materials are used. Before you move into a newly built home, remove all strainers from faucets and flush the water for at least 15 minutes to remove loose solder or flux debris from the plumbing. Occasionally, check the strainers and remove any later accumulation of loose material.

Q What about lead in sources other that drinking water?

A As mentioned above, drinking water is estimated to contribute only 10 to 20 percent of the total lead exposure in young children. Ask your local health department or call EPA for more information on other sources of exposure to lead. A few general precautions can help prevent contact with lead in and around your home:

- Avoid removing paint in the home unless you are sure it contains no lead. Lead paint should only be removed by someone who knows how to protect you from lead paint dust. However, by washing floors, window sills, carpets, upholstery and any objects children put in their mouths, you can get rid of this source of lead.
- Make sure children wash their hands after playing outside in the dirt or snow.
- Never store food in open cans. Keep it in glass plastic or stainless steel containers. Use glazed pottery only for display if you don't know whether it contains lead.
- If you work around lead, don't bring it home. Shower and change clothes at work and wash your work clothes separately.

Q Aren't there a lot of types of treatment devices that would work?

A There are many devices which are certified for effective lead reduction, but devices that are not designed to remove lead will not work.

It is suggested that you follow the recommendations below before purchasing any device:

- Avoid being misled by false claims and scare tactics. Be wary of "free" water testing that is provided by the salesperson to determine your water quality; many tests are inaccurate or misleading. Research the reputation and legitimacy of the company or sales representative.
- Avoid signing contracts or binding agreements for "one-time offers or for those that place a lien on your home. Be very careful about giving credit card information over the phone. Check into any offers that involve prizes or sweepstakes winnings.
- As suggested above, verify the claims of manufacturers by contacting the National Sanitation Foundation International or the Water Quality Association.

Q What is the government doing about the problem of lead in household water?

A There are two major governmental actions to reduce your exposure to lead:

- Under the authority of the Safe Drinking Water Act, EPA set the action level for lead in drinking water at 15 ppb. This means utilities must ensure that water from the customer's tap does not exceed this level in at least 90 percent of the homes sampled. If water from the tap does exceed this limit, then the utility must take certain steps to correct the problem. Utilities must also notify citizens of all violations of the standard.
- In June 1986, President Reagan signed amendments to the Safe Drinking Water Act. These amendments require the use of "lead-free" pipe, solder, and flux in the installation or repair of any public water system, or any plumbing in a residential or non-residential facility connected to a public water system.

Under the provisions of these amendments, solders and flux will be considered "lead-free" when they contain not more than 0.2 percent lead. (In the past, solder normally contained about 50 percent lead.) Pipes and fittings will be considered "lead-free" when they contain not more than 8.0 percent lead.

These requirements went into effect in June 1986. The law gave state governments until June 1988 to implement and enforce these new limitations. Although the states have banned all use of lead materials in drinking water systems, such bans do not eliminate lead contamination within existing plumbing. Also, in enforcing the ban, some states have continued to find illegally used lead solder in new plumbing installations. While responsible plumbers always observe the ban, this suggests that some plumbing installations or repairs using lead solder may be escaping detection by the limited number of enforcement personnel.

Where can I get more information?

First contact your county or state department of health or environment for information on local water quality.

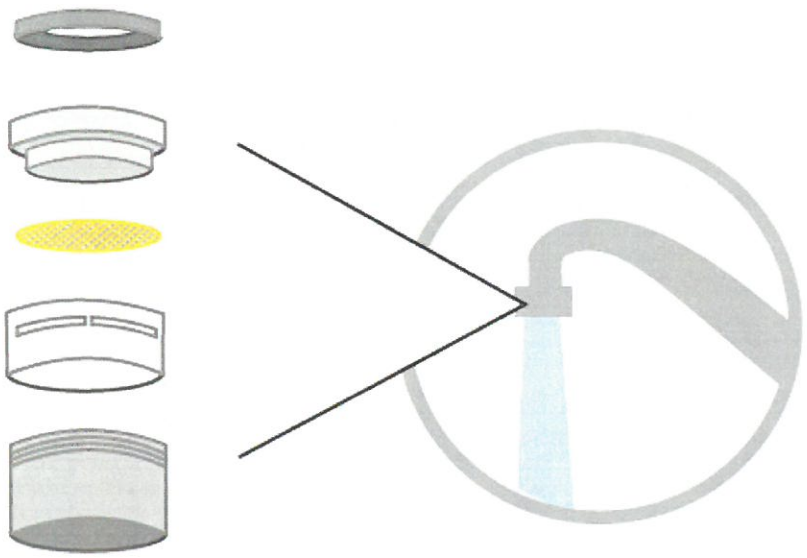
For more general information on lead, there are now two toll-free telephone services:

EPA Safe Drinking Water Hotline

1-800-426-4791

National Lead Information Center

1-800-LEAD-FYI

Clean Faucet Aerators Weekly

1. Unscrew the end-piece of your faucet where the water comes out. This is the aerator. (Make note of how the pieces come off, to put back together. Parts vary.)
2. Remove the screen and rinse out any dirt that has collected.
3. Screw it back on.