Lead and Copper in Drinking Water

Important Information on How to Protect Your Health

Lead Health Effects

Lead is a common metal that has been in many consumer products but is now known to be harmful to human health if ingested or inhaled. It can be found in lead-based paint, air, soil, household dust, food, some types of pottery, and drinking water. Lead is rarely found in natural sources of water such as rivers and lakes or underground aquifers.

When people come in contact with lead, it may enter their bodies and accumulate over time, resulting in damage to the brain, nervous system, red blood cells, and kidneys. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities.

Lead in water can be a special problem for infants whose diets may be mostly liquids, such as baby formulas or concentrated juices mixed with water. Smaller bodies can absorb lead more rapidly than bigger ones, so amounts of lead that won't hurt an adult can be very harmful to a child. Adults who drink this water over many years could develop kidney problems or high blood pressure.

Copper Health Effects

Copper is a reddish metal that occurs naturally in rock, soil, water, sediment, and air. It has many practical uses in our society and is commonly found in coins, electrical wiring, and pipes. It is an essential element for living organisms, including humans, and - in small amounts - necessary in our diet to ensure good health. However, some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience adverse health effects, including vomiting, diarrhea, stomach cramps, and nausea. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage.

The human body has a natural mechanism for maintaining the proper level of copper in it. However, children under one year old have not yet developed this mechanism and, as a result, are more vulnerable to the toxic effects of copper. People with Wilson's disease also have a problem with maintaining the proper balance and should also exercise particular care in limiting exposure to copper. People with Wilson's Disease should consult their physician.

Sources of Lead/Copper

Lead usually gets into your water after it leaves the treatment plant. This usually happens through the corrosion of materials containing lead in household plumbing. The most likely sources of lead in your household water are lead pipes, lead solder on copper pipes, brass faucets, fittings, and valves, including those advertised as "lead-free," or lead service lines connecting the water main to the inside plumbing. Lead pipes are no longer installed for service lines or in household plumbing, and lead solder has been outlawed in Minnesota since 1985.

The amount of lead allowed in brass fixtures has also been limited, but can still contribute some lead to drinking water (note that many faucets are made of brass even if they do not have a "brass" color). Even with these restrictions in place, some homes, especially older homes, may still have significant amounts of lead in their plumbing systems.

Copper works its way into the water by dissolving from copper pipes in the household plumbing. The longer the water has stood idle in the pipes, the more copper it is likely to have absorbed. Newer homes with copper pipes may be more likely to have a problem. Over time, a coating forms on the inside of the pipes and can insulate the water from the copper in the pipes. In newer homes, this coating has not yet had a chance to develop.

How To Reduce Your Exposure

Anytime the water has not been used for more than 6 hours - overnight, for example, or during the day when people are gone to work or school - it should be cleared from the pipes before being used for drinking or cooking. Let the cold water faucet run until you can feel the water getting colder, usually 30 to 60 seconds. The amount of time it takes will depend on your home and how its plumbing is arranged. If your home has a lead service line (which you can determine by asking your local water utility), you should flush water for an additional 2 to 3 minutes to make sure you are getting fresh water from the water main. This must be done before taking drinking water from any faucet in the house.

Other household water uses will also help clear standing water from your home's plumbing. For example, you may want to establish a routine of doing household tasks that use water - such as showering, flushing the toilet, or running the dishwasher - first thing in the morning before using water for drinking or cooking. Keep in mind that you'll still need to flush individual faucets for a short time before using them for drinking water.

Hot water dissolves lead/copper more quickly than cold water so don't use water from your hot-water faucet for cooking or drinking. If you need hot water for cooking or drinking, take water from the cold water tap and heat it. It is especially important not to use the hot water for making baby formula. Also, boiling the water does not reduce lead levels and may actually increase them.

Some treatment devices can reduce the amount of lead in your drinking water. Reverse-osmosis and distillation units can be used for that purpose. A few types of water filters also remove lead. Check the product literature to be sure it has been certified for lead removal by NSF International (http://nsf.org). Also, you must follow the manufacturer's recommendations for operation and maintenance to ensure that the treatment equipment works correctly.

The water you run from drinking water taps does not have to be wasted. You can use this water for cleaning purposes or for watering plants. You may want to keep a container of drinking water in your refrigerator, so you don't have to run water every time you need it.

Many laboratories can test your water to see if there is a lead problem. Fees will vary between labs. Check your Yellow Pages under "Laboratories-Testing."

For more information, please visit EPA's website at: www.epa.gov/lead.

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