

LEAD AND COPPER IN WATER AND HEALTH EFFECTS

Lead and Copper in Water Questions & Answers – Water Quality Work Group Review DRAFT 2

1. How does lead get into drinking water?

Drinking water provided by the GLWA does not contain lead. Lead may enter drinking water as a result of the corrosion or wearing away of materials in the water distribution system and household plumbing that contain lead. These materials can include lead-based solder, brass and chrome-plated brass faucets and fixtures, and lead service lines connecting homes to water mains. Corrosion control practices reduce the risk of lead leaching from pipes by creating a protective film or coating inside the pipe. The GLWA, formerly DWSD, has used orthophosphate to control corrosion since 1996.

2. What are the major sources of lead exposure?

The most common cause of lead poisoning is from contaminated paint chips and dust. Lead was used in household paint until 1978 leaving lead contamination in homes and surrounding soils. Leaded gasoline, used until the mid-1980s, has also contributed to increased lead levels in soil. Lead was used in drinking water service lines in Michigan until 1947 in some areas and lead-based solder on copper pipes found in household plumbing until 1986. Prior to 2014, “lead free” household plumbing fixtures could contain up to 8% lead. The definition of “lead free” plumbing fixtures and solder was reduced to even lower levels in 2014. Lead can leach from these pipes when corrosive water runs through them, hence the need for corrosion control additives.

3. What health problems are associated with lead exposure?

Short answer:

Lead can affect almost every organ and system in your body. Children 6 years old and younger are most susceptible to the effects of lead. According to the USEPA, “even low levels of lead in the blood of children can result in behavior and learning problems, lower IQ, hyperactivity, slowed growth, hearing problems and anemia.” Pregnant women are at particular risk from lead exposure that can result in reduced fetus growth and premature birth. Adults can suffer from cardiovascular effects, decreased kidney function and reproductive problems.

Contact your physician if you are concerned about lead exposure. Additional information on the health effects of lead can be found on the EPA’s website <https://www.epa.gov/lead/learn-about-lead>

More detailed answer:

According to the USEPA, lead can affect almost every organ and system in your body. “Children 6 years old and younger are most susceptible to the effects of lead. Even low levels of lead in the blood of children can result in:

- Behavior and learning problems
- Lower IQ and hyperactivity
- Slowed growth
- Hearing problems
- Anemia

Lead can accumulate in our bodies over time, where it is stored in bones along with calcium. During pregnancy, lead is released from bones as maternal calcium and is used to help form the bones of the

fetus. This is particularly true if a woman does not have enough dietary calcium. Lead can also cross the placental barrier exposing the fetus to lead. This can result in serious effects to the mother and her developing fetus, including:

- Reduced growth of fetus
- Premature birth

Adults exposed to lead can suffer from:

- Cardiovascular effects, increased blood pressure and hypertension
- Decreased kidney function
- Reproductive problems (in men and women)

From EPA's website <https://www.epa.gov/lead/learn-about-lead>

4. How does copper get into drinking water?

Like lead, copper can leach out of plumbing materials if corrosive water flows through the pipe. The protective film created by the addition of orthophosphates can also reduce the risk of copper leaching from pipes.

5. What health problems are associated with copper exposure?

Copper is an essential nutrient. "Short term exposure to copper levels above the action level in drinking water can cause gastrointestinal distress. Long term exposure can cause liver or kidney damage. People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level." Wilson's disease is an inherited condition that causes the body to retain excess copper. Persons with Wilson's disease may be at a higher risk of health effects than the general public.

From EPA's website <https://www.epa.gov/ground-water-and-drinking-water/table-regulated-drinking-water-contaminants>

6. Where can I find lead and copper health effects information?

Information about the health impacts of lead can be found on the Centers for Disease Control and Prevention's website:

<http://www.cdc.gov/nceh/lead/>

A public health statement for copper can be found on the Agency for Toxic Substances & Disease Registry's website:

<http://www.atsdr.cdc.gov/phs/phs.asp?id=204&tid=37>