Clinician Guidance on Elevated Copper Level
Sherman Township - Gay Location, Drinking Water

This clinician guidance provides context and Information regarding questions clinicians may receive from patients about a recent detection of an elevated copper level in the Sherman Township water supply in the Gay Location of Keweenaw County. Routine testing mandated under the Lead and Copper Rule detected the action level exceedance for copper in the Sherman Township Water Supply of 1.9 parts per million (ppm), which is above the Action Level of 1.3 ppm.

Public Health Recommendation

The Michigan Department of Health and Human Services (MDHHS) recommends homes with a formula-fed infant less than 12 months of age whose families are on the Sherman Township Water Supply, use cold-flushed water for making formula and for drinking. Flushing should continue until the water supplier indicates copper is no longer a concern. A resident may also choose to use a water filter certified to reduce copper or bottled water for a formula fed infant.

People with disorders of copper metabolism should continue to avoid potential sources of copper, such as drinking water that contains copper, according to their clinician's recommendations.

Copper Background

Copper is needed for all living things to survive. A person's diet should include small amounts of copper in order to be healthy. While copper is important to our health, high amounts can be harmful.

Copper is more likely to get into drinking water when pipes or faucets containing copper begin to dissolve or break down. Copper is commonly found in the environment and can be increased by human activities such as mining and wastewater release. It can also be found in groundwater and surface water used for drinking water.

Health Concerns

- Drinking water with high levels of copper may lead to gastrointestinal upset such as nausea, vomiting, diarrhea or abdominal cramps. Intentional high intake of copper can cause kidney and liver damage.
- Infant formula already has adequate dietary copper. Mixing infant formula with drinking water containing higher levels of copper may lead to gastrointestinal upset in infants under the age of one year, as babies may be more sensitive to elevated copper levels.
- Persons with rare genetic disorders of copper metabolism, such as Wilson's Disease, should avoid drinking water with higher levels of copper given increased risk of copper bioaccumulation.
- The U.S. Environmental Protection Agency does not classify copper as a human carcinogen because there are no adequate human or animal cancer studies.
- It is unknown whether copper can cause birth defects or other developmental effects in humans.
- Limited data suggests breast milk is not an exposure concern for breast-feeding children.
- There is no recommended treatment or chelation therapy.

Is there a Medical Test for Copper?

- Copper can be detected in hair, nails, blood, urine and other tissues. High levels of copper in these samples can indicate higher levels of copper exposure.
- It is not recommended that testing be done at this time.

Actions that can Reduce Copper in Drinking Water

- **Run water to flush out copper.** If water has not been used for several hours, flushing pipes may reduce the amount of copper in drinking water. To flush the pipes in the home, do any of the following:
    - Turn a cold-water faucet on all the way and let it run
    - Take a shower
    - Run a load of laundry
    - Run your dishwasher

  Before using the water from any specific faucet for drinking or cooking, run the cold water again until it goes from room temperature to cold. This flushes out any water that had been sitting in that sink's faucet and pipes.
- **Clean faucet aerators. Aerators (the mesh screens on sink faucets) can trap pieces of copper.**
    - Clean the drinking water faucet aerator at least every six months.
    - If there is construction or repairs to the public water system or pipes near the home, clean the drinking water faucet aerator every month until the work is done.
- **Consider using a filter to reduce copper in drinking water.** Patients can also choose to use a water filter certified to reduce copper in water. If buying a filter, look for the certification number NSF/ANSI Standard 53 for copper reduction and NSF/ANSI Standard 42 for particulate reduction. Follow the manufacturer's instructions for filter installation and maintenance.
    - If a clinician is concerned that persistent gastrointestinal symptoms in an infant may be due to copper ingestion and feels that a filter is indicated, the clinician may contact one of the local services below to request a free water filter for the family, provided the infant is on Medicaid, receives WIC benefits, or the family is unable to afford a filter.
        - Western Upper Peninsula Health Department
          906 482-7382
- **Use cold flushed or filtered water for:**
    - Drinking, cooking, or rinsing food
    - Mixing powdered infant formula
    - Brushing teeth
- **Water that is not filtered or flushed** can be used for:
    - Showering or bathing
    - Washing hands, dishes, and clothes
- **Test water for copper.** Contact a certified laboratory to find out how to get water tested for copper. A list is available at www.michigan.gov/drinkingwater.

Actions that Will Not Reduce Copper in Drinking Water

- **Do not boil water to remove copper.** Water evaporates during boiling, so levels of copper in the water may end up higher than before boiling.
    - **Formula fed infants** - Clinicians should consider the increased risk of copper levels in drinking water if patients are routinely advised to boil water to reduce risk of potential

infections from nonsterile formulas or drinking water. In this case, bottled water could be used and boiled as recommended.

- **Do not use hot water for drinking or cooking**. Copper dissolves more easily into hot water.

Lead and Copper Rule (LCR)

The purpose of the Lead and Copper Rule (LCR) is to protect public health by minimizing lead and copper levels in drinking water. All community water supplies and non-transient, non-community water supplies are subject to the LCR requirements.

What is an Action Level? What does it mean to exceed an Action Level?

- Lead and copper can enter drinking water when it comes into contact with corroding plumbing materials containing lead and copper.
- The Lead and Copper Rule establishes action levels (AL) for lead and copper based on a 90th percentile level of tap water samples. The Action Level for copper is 1.3 parts per million (ppm) in drinking water.
- When more than 10 percent of tested homes on the same water supply have drinking water containing more than 1.3 ppm of copper in the water, the water supply has exceeded the Action Level.
- An Action Level Exceedance (ALE) is not a violation but triggers other requirements to minimize exposure to lead and copper in drinking water, including water quality parameter monitoring, corrosion control treatment, source water monitoring/treatment, public education, and lead service line replacement.

The Sherman Township Water Supply will need two consecutive 6-month periods where the 90th percentile for copper is less than 1.3 ppm for the water supply to resolve the Action Level Exceedance for copper.

Further Resources

- Michigan Department of Environment, Great Lakes, and Energy
  - Lead and Copper Rule www.michigan.gov/lcr
  - Drinking Water Information www.michigan.gov/drinkingwater
- ATSDR *ToxFAQs™ for Copper* https://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=205&tid=37
- Agency for Toxic Substances and Disease Registry (ATSDR), September 2004. *Toxicologic Profile for Copper.* https://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=206&tid=37