Drinking Water Facts:

Lead in Drinking Water

General Information

There is no safe level of lead in the body. Sources of lead exposure include ingestion of lead-based paint chips and dust, inhalation of lead dust in the air, and ingestion of lead in drinking water. Imported candies, cosmetics, toys, and other products may also contain lead.

Lead in Drinking Water

Lead is a soft gray metal. Until it was banned by federal law in 1986 and by New Jersey law in 1987, lead was used in the solder that connects pipes, in pipes used in household plumbing, and in service lines (Lead Service Lines (LSL)) that connect houses to the public water mains in the street. Some of these lead pipes may still be found in parts of New Jersey where housing is more than 50 years old. Lead in drinking water has no taste, odor, or color.

Although the primary source of exposure to children is lead-based paint used inside or on houses built before 1978, it is estimated that 20% or more of human exposure to lead may come from lead in drinking water. Formula-fed infants can receive 40-60% of their lead exposure from drinking water containing lead. These estimates will vary individual to individual.

Factors Increasing Risk of Lead in Drinking Water

- **Plumbing materials containing lead:** Lead solder used for connecting pipes contains about 50% lead. Sloppy soldering can increase the amount of lead dissolved into the water. Brass fixtures and faucets can contain up to 8% lead. Having a lead service line can increase risk.
- **If you have a private well:** Lead can get into your drinking water from well parts made of lead or from a nearby industrial waste facility or municipal landfill.

Factors Increasing Risk (continued)

- **Length of time water stands in pipes:** The longer water stands in the plumbing the more likely that lead, if present in the plumbing materials, will build up in the drinking water.
- **Corrosiveness of water:** Corrosive water caused by high acidity, low mineral content, or high chloride, can increase the amount of lead that can get into the drinking water.
  - **Acidic water** tends to dissolve lead from pipes or solder into the water.
  - **Minerals** tend to form a protective barrier around lead solder and decrease the amount of lead that could be dissolved. Water that has a low mineral content can dissolve lead from solder into the water.
  - **High chloride** contributes to increased corrosion in water and can make lead soluble.

Health Effects of Lead

Lead can cause a variety of harmful health effects. The type and severity of these health effects depend on how much lead has built up in the body over time. When water which contains lead is ingested, some of it is absorbed through the digestive tract. Once absorbed, lead is distributed to all parts of the body through the blood and builds up mostly in the bone. A certain amount of lead remains in the blood.

Children and fetuses are the most sensitive to the harmful effects of lead. Even low levels of lead in blood may affect the ability to pay attention and cause poor academic achievement and behavioral problems. Most children with elevated blood lead levels do not exhibit any symptoms, however effects may appear later in age. Other health effects may include kidney damage, anemia, and reductions in birth weight. Symptoms of severely elevated blood lead levels (lead poisoning) may include stomach aches, vomiting, poor appetite, or nausea.

Consumer, Environmental and Occupational Health Service
Environmental and Occupational Health Surveillance Program
nj.gov/health/ceohs/sanitation-safety/drinking-water-public-health/index.shtml

NJHealth New Jersey Department of Health

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Young Children at Greatest Risk

Children younger than six years old are at greatest risk from exposures to lead. The impact of exposure to lead in drinking water depends on the child's age, source of water consumption, the potential concentration of lead in drinking water, and other sources of lead exposure.

- Children younger than six years old, particularly toddlers, are most likely to engage in frequent hand-to-mouth activities which increases the potential for them to ingest lead-based paint chips and dust.
- Infants who drink formula mixed with water containing lead are ingesting much more lead than older children who receive most of their nourishment through food.
- Young children absorb more lead through their stomach than older children or adults.
- Young children have developing brains and nervous systems which make them the most vulnerable to health effects of lead.

Blood Testing for Lead

Tests are available to measure the amount of lead in the blood. NJ Law requires that children are screened for lead at both 1 and 2 years of age. Children 3 to 5 years of age should also be screened if they have not been screened before. Consult your health care provider or local health department if you have a reason to believe a member of your family has been exposed to lead.

Blood Lead Reference Value

There is no safe level of lead. However, as of May 2021, the Centers for Disease Control and Prevention (CDC) uses a **blood lead reference value of 3.5 micrograms per deciliter (µg/dL).** This level identifies children with blood lead levels higher than the blood lead levels of 97.5% of children 1-5 years of age in the U.S. Previously the reference value (formerly "level of concern") was 5 µg/dL.

The reference value can be used to identify recommended follow-up actions which can include a home visit by a nurse case manager and lead inspector/risk assessor, assistance with testing other children and pregnant women in the home, assessment of your family's needs for community resources, and providing education.

Lead in Drinking Water Results

- 90th percentile water results for your public water utility are available at NJDEP Drinking Water Watch. These results are collected among the homes and buildings at highest risk of having a lead exceedance.
- If you are a private well owner, you should test your drinking water for lead using a New Jersey certified laboratory which can be found at NJDEP Dataminer.

Regulations for Lead in Drinking Water

The USEPA Lead and Copper Rule (LCR):

- Established in 1991, requires all Public Water Systems (PWS) to monitor for lead throughout the distribution system, and report results to NJ Department of Environmental Protection.
- The first major update to LCR in 30 years was effective in December 2021. Changes include:
  - Targets sampling to homes with greatest potential of elevated lead levels
  - Triggers actions to reduce lead exposure earlier and in more communities
  - More rapid implementation of corrosion control following a lower trigger level
  - Requires PWS and states to develop public inventory of LSL and replace more LSL.
- USEPA's 2024 Lead and Copper Rule Improvements (LCRI) strengthen the LCR by including additional requirements to locate legacy lead pipes, improve tap sampling, lower lead action level, include filter requirements, and improve communication.
  For more detailed information, please visit:
  epa.gov/dwreginfo/lead-and-copper-rule

In New Jersey, several significant laws pertaining to lead have been enacted since 2020. These include a variety of laws which:

- Require all LSLs be inventoried and replaced in the next 10 years.
- Require water systems notify customers of a lead action level exceedance within 10 days and landlords to notify tenants within three days of the notice.
- Require seller disclosure for the presence of lead plumbing in residential property.
- Require water systems respond to customers requesting sampling for lead and copper or during an action level exceedance or after a partial LSL replacement.

For more detailed information, please visit:
nj.gov/dep/lead/ and
state.nj.us/dep/watersupply/dwc-lead.html

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Did You Know?

Effective July 13, 2016, schools in New Jersey are required to test for lead in drinking water (N.J.A.C. 6A:26-1.2 and 12.4). In addition, effective January 12, 2017, all licensed childcare centers in New Jersey are required to test for lead in drinking water (N.J.A.C. 3A:52-5.3(i)5). See Resources section below.

Tips to Reduce Potential Drinking Water Lead Exposure at Home

- If water in a particular faucet is not used for six hours or longer, "flush" the pipes by running cold water through it until the water is noticeably colder—about one minute. The more time water sits in your home's pipes, the more lead and other dissolved metals the water may contain.
- Use only cold water for drinking, cooking, and making baby formula. Hot water may contain higher levels of lead.
- Clean the screens and aerators in faucets frequently to remove captured lead particles.
- If building or remodeling, only use "lead-free" piping and materials for plumbing.
- Lead is odorless, tasteless, and colorless so the only way to determine if lead is in your drinking water is to have the water tested.

If you have a LSL or water results indicate you have lead in your drinking water:

Until you can identify and mitigate the source of lead in your water or until you water utility can reduce lead levels in their system, use an NSF or WQA-certified filter for lead removal or use bottled water for all water you use for drinking or cooking.

Boiling water does not remove lead from drinking water. Excessive boiling of water can increase the lead concentration in the water by evaporation. Washing clothes and dishes and showering and bathing are considered safe uses of water containing lead.

Home water treatment devices

- Point-of-use home filters are effective at removing lead from drinking water. These are commonly found at most grocery and big-box retail stores.
- Make sure the filter you purchase is NSF or WQA-certified for lead removal (NSF/ANSI standard 53 for lead removal and NSF/ANSI standard 42 for particulate removal). These are certified to reduce lead levels in your water below the federal standard for lead. NSF International and Water Quality Association (WQA) are third-party organizations which evaluate and certify drinking water treatment systems meet standards.
- It is important to maintain home water filters according to the manufacturer's instructions.
- Private wells – whole-house carbon filters and reverse osmosis (RO) units will remove lead from water. A RO system can make the water more corrosive by removing certain minerals so a pH neutralizer may be needed. Consult with a water treatment professional for best water treatment options for your home.

Resources

- **NJ Department of Education** - Regulations regarding testing for lead in drinking water in schools, visit: nj.gov/education/lead/
- **NJ Department of Environmental Protection**: Lead Sampling Information:
  - Schools nj.gov/dep/watersupply/schools.htm
  - Child care centers nj.gov/dep/watersupply/pw_child.html
  - Public water system lead data: state.nj.us/DEP_WaterWatch_public/
  - List of certified labs to test your water for lead: njems.nj.gov/DataMiner/

  Potential Lead Exposure Mapping (PLEM) njdep.maps.arcgis.com/apps/MapSeries/index.html?appid=6472457d42ab474b87f735de8d8ee205&utm_medium=email&utm_source=govdelivery
- **NJ Department of Health –** Information on Lead in Drinking Water at Schools and Childcare Centers: nj.gov/health/ceohs/documents/dwf_lead_schools.pdf
- **Other Resources**:
  - For information on how to reduce exposures to lead-based paint in your home and for resources regarding blood lead testing, visit: nj.gov/health/childhoodlead/prevention.shtml
  - For information on NSF home water filters, visit: nsf.org/consumer-resources/water-quality/drinking-water/

Abbreviations: ppb=parts per billion; NSF=National Sanitation