Children's Environmental Health Center of the Hudson Valley

New York Medical College, Valhalla, New York 10595

P: 914-493-7585 F: 914-594-2350

CHILDREN'S ENVIRONMENTAL HEALTH CENTER OF THE HUDSON VALLEY
PROTECTING CHILDREN AGAINST ENVIRONMENTAL THREATS
www.ChildrensEnvironment.org

June 2016- CHILDREN'S HEALTH ADVISORY
Lead in Drinking Water

June 2016: Many instances of exposure to lead in the U.S. originate from consuming water from buildings that contain old lead piping. Recently, there have been a number of cases reporting the presence of lead in drinking water in some schools in the U.S. Many older buildings continue to have lead pipes due to high replacement costs, which can be millions of dollars.

Lead poisoning can be a direct effect of consuming water that contains lead. Lead poisoning is exponentially more dangerous for children than for adults as it can result in a lowered I.Q. and a number of behavior disorders.

What is lead and why is it dangerous? Lead is a naturally occurring metal, which can result in serious health problems with long term exposure. Lead is used in innumerable common items such as construction materials, pesticides, cable covers and batteries. The population at greatest risk for health problems due to lead exposure is unborn babies and young children. Children are more prone to absorbing lead into their bloodstream due to a more susceptible, developing body. Once lead enters the body, it begins to circulate through the circulatory system, similar to the helpful minerals we ingest. If lead enters the bloodstream, it can reduce red blood cell function, decreasing ability to carry oxygen to vital organs. This lack of oxygen can result in anemia. The brain is also able to absorb lead readily. When this happens, lead can affect the frontal cortex. This can result in damage to abstract thought and attention. Lead can also affect the hippocampus which plays a role in the ability to learn and memorize.

Health Effects: Exposure to lead can cause both short and long term health problems.

Short-term	Long-term
Cramps	Anemia
Headaches	Infertility
Lowered I.Q.	Tremors
Miscarriage	Hypertension
Hearing Loss	Kidney Damage

Prevalence: Each year in the United States, research is done to evaluate the levels of lead in the bloodstream of children. 310,000 children in the United States, between the ages of one and five, are found to have unsafe levels of lead in their blood. This can lead to many acute or chronic health problems.

In April 2014, a high level of lead contamination was discovered in the drinking water in Flint, Michigan. The crisis began after Flint switched its source of water to the Flint River. Water from the Flint River was found to be corrosive, so lead from the old pipes began to seep into the supply of drinking water. Between 6,000 and 12,000 children in Flint have been exposed to drinking water with high levels of lead. In September 2015, it was been found that the percentage of tested children with elevated lead levels in the bloodstream was 5%, a rise from 2.5% in 2013. The Flint water crisis called attention to the problem of aging and seriously neglected water infrastructure nationwide.

Regulation: The Safe Drinking Water Act and the Copper Rule of 1991 forced most water utilities to update their systems with lead free pipes. However, lead in drinking water continues to be a problem in some areas of the U.S. According to Purdue University's Department of Earth Sciences, lead poisoning is still extremely high in some areas, especially urban areas. The presence of lead in soil is thought to be a source. The Department of Earth Sciences suggests that during construction, the process of "capping" is required. This is a method where the lead contaminated soil is "capped" with lead free soil, a simple yet effective process that aids in the reduction of lead exposure.

Treatment: The primary form of treatment for lead poisoning is further prevention of exposure to lead and the removal of lead from everyday life.. For extremely high lead levels in the blood, chelation therapy can be instituted. This is a process in which a lead-binding chemical is introduced into the bloodstream. This protects the organs from further damage, but does not aid in the repair of damage that has already been done. Children with low levels of lead in the bloodstream cannot be treated. In cases of low levels of lead in the bloodstream, the only "treatment" is to reduce lead exposure. Over time with reduced lead exposure, the levels of lead in the blood will begin to drop.

References:

1. “Toxic Metal: The Health Dangers of Lead:” http://www.globalhealingcenter.com/natural-health/toxicmetalhealthdangerslead/

2. “Toxicity of lead: A review with recent updates.” http://www.ncbi.nlm.nih.gov/pubmed/23118587

3. “Is There Lead in Your Kid's School Water? NBC Surveys 20 Big Cities” http://www.nbcnews.com/news/usnews/thereleadyourkidsschoolwaternbcsurveys_20n567126

4. “Lead In Water: What Are The Health Effects And Dangers?” http://www.popsci.com/lead-waterwhatarehealtheffectsdangers

5. “In Flint, Mich., there’s so much lead in children’s blood that a state of emergency is declared” https://www.washingtonpost.com/news/morning mix/wp/2015/12/15/toxicwater-soaringl eadlevelsinchildrensbloodcreatestateofemergencyinflintmich/