PEOPLE'S ACTION INSTITUTE
Center for Health, Environment & Justice
Mentoring a Movement, Empowering People, Preventing Harm
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Testing for Lead in Drinking Water

Since the water crisis in Flint, MI, lead in drinking water has become a major public health concern. Lead can be present in water without any noticeable change in the odor, taste, or smell making it nearly impossible to detect without doing a specific test to look for it. This factsheet provides what you need to know about lead in your drinking water.

Doing It Yourself

Many people's first response to concerns about contaminants in drinking water is to want to test their water to determine what's in it. While many do-it-yourself test kits are available as well as accredited labs that can run tests for you, it is important to know that in both cases the results may not give you what you want and may be misleading.

Lead levels in water can fluctuate dramatically throughout the day, sometimes by as much as tens to hundreds of times higher. In other words, a sample taken from your kitchen faucet can dispense water that's tested at below the EPA action level of 15 parts per billion (ppb), and then later spew out water with lead up to hundreds or even thousands of ppb.[1] By testing your water for lead only once or twice, as is standard practice, you do not necessarily get a reliable or accurate estimate of the lead content in your water. After a single negative test, you would probably think your water is safe to drink, when in reality it may contain dangerous levels of undetected lead.

Multiple factors influence the concentration of lead in drinking water at any point in time including:

- **The Time of Day** - Water that's been sitting in the pipes for a long time, such as overnight or during a workday, tends to have more lead than water that's been regularly flowing.
- **Temperature of the Water -** Hot water corrodes lead from surrounding pipes more than colder water does, making it easier for lead particles to break off into the water.
- **Sheer Fortune -** Lead particles in plumbing can break off at any time, randomly endangering the water.

EPA has established procedures for testing lead in drinking water that attempt to minimize these factors. You can find these test procedures here: http://chej.org/wp-content/uploads/EPA's-Guidance-on-Testing-Lead-in-Drinking-Water.pdf

Because of the erratic and fluctuating concentration of lead in water, at-home test kits should not be used as the only determinant for whether your water is safe to drink. You should use the kit repeatedly under different conditions to address the potential fluctuations due to the factors mentioned above. One kit you may want to consider is the First Alert WT1 Drinking Water Test Kit. This kit is highly popular (we found no independent reviews of do-it yourself testing kits) and is considered easy to use. The results change color depending on the amount of lead in the water. If you use a kit like this, keep in mind that the result is a snapshot in time and not a clear and accurate estimate of the lead in your water.

Seeking Out Professional Assistance

Government agencies, local utilities, or state-certified labs are widely regarded as more reliable and accurate places to measure lead content in drinking water. Just like the at-home test kits, though, taking a single sample or two and sending

[1] http://www.tandfonline.com/doi/abs/10.1080/10643389.2011.556556

them to a professional lab will not provide an accurate representation of the lead content in your water. If you decide to send samples to a lab, make sure the lab is certified by the EPA, that you follow the EPA's sampling guidelines (see above) and to collect samples at different times.

Before you turn to a professional to test your water, obtain a copy of the EPA mandated Consumer Confidence Report (CCR) made available by all municipal water systems. The CCR includes testing results for lead and other contaminants in drinking water. You can find your CCR here: https://www.epa.gov/ground-water-and-drinking-water. This website also provides useful resources including links to a safe drinking water hotline, regulations on water quality standards, and to background information on lead and other contaminants. The Centers for Disease Control (CDC) makes available a list of state lead programs that provide additional local information and resources on lead in drinking water. The list can be found here: https://www.cdc.gov/nceh/lead/programs/default.htm.

The lead results reported in the CCR are determined by procedures defined in EPA's Lead and Copper Rule (LCR). This rule establishes a 15 ppb maximum lead threshold, or action level, and enforces that level for only a fraction of tap water sample results. This is an unusual way to define whether a municipality has lead in its water that exceeds the 15 ppb action level. Water samples are taken from a small portion of the entire water system each year. Of that amount, only 90% need to have lead concentrations below 15 ppb in order for the entire community's water to be deemed safe. Every household that gets sampled is then notified of their lead levels, as part of the rule, but as long as 90% of these samples are below the action level, the rest of the community is not tested for lead and remains in the dark. There may be a home that has 1,000 ppb lead in its water, but if 90% of the tested homes have lead below the 15 ppb threshold, the water system is considered in compliance and no action is taken. Plus, only the property owner knows about the 1,000 ppb result. Furthermore, if the house with 1,000 ppb lead in its water is not ever sampled, they will have no idea how dangerous their drinking water is. Instead they will be told that their water has been tested and found to be "safe" from lead when no sample was ever taken from their tap. For this reason, lead results reported on the CCR should be taken with a grain of salt. A study funded by a water utility industry found that if the sampling protocol used to determine compliance with LCR were designed to focus on the worst-case lead from lead service lines, over 70% of water utilities with these plumbing fixtures would violate the 15 ppb threshold, legally requiring urgent remedial action.[2]

Another problem with the LCR; that the 15 ppb action level still presents significant risks, especially for young children, infants, and pregnant women. No quantity of ingested lead is safe for the human body. The American Academy of Pediatrics recommends a health-protective standard of 1 ppb or less of lead in water for schools and other sources of water for developing children.[3] Ingesting any amount of lead during the first 6 years of a child's life lead to learning difficulties, behavior problems, slowed growth, and a lower IQ, amount other ailments.[4] The actual health-based goal for lead, defined by EPA, is zero. The 15 ppb figure represents a more "realistic" and achievable number for utilities and water companies due to technological and logistical constraints.

Official testing and reporting on lead in drinking water following the LCR and the failure of these tests to account for the fluctuations in lead under different conditions leaves many households vulnerable to drinking lead-contaminated water that they've been told is completely safe. To address these limitations and the extent of lead plumbing, the DC Public School System decided in 2016 to install filtration systems on all drinking water sources, essentially assuming this was the only way to truly protect children from lead in their drinking water. These proactive measures provide a higher degree of safety from lead contamination. More on filters can be found in *Filters for Removing Lead in Drinking Water*.

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[2] http://lead.org.au/lanv18n2/LANv18n2-Truth-about-lead.pdf?cn=bWVzc2FnZV9qb2luX2NvbnZlcnNhdGlvbg%3D%3D&refsrc=email

[3] https://www.aap.org/en-us/about-the-aap/aap-press-room/pages/With-No-Amount-of-Lead-Exposure-Safe-for-Children,-American-Academy-of-Pediatrics-Calls-For-Stricter-Regulations.aspx

[4] https://ehp.niehs.nih.gov/wp-content/uploads/2017/09/EHP1605.alt_.pdf