

Report to the Boards of Health

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Updates In Lead

Lead is an elemental metal that occurs naturally and is used in the production of many things such as batteries, ammunition, and metal products (solder and pipes). In the past it was used much more widely in paints, ceramic products, caulking, and pipe solder, as well as in gasoline, but due to health concerns, the use of lead has been greatly reduced. Unfortunately, since it is an element, it does not break down. Lead that was released into the air by gasoline or is still being released in other pollution can travel long distances before settling. Lead on the ground can stick to the soil. Soil can also get contaminated by lead from old gasoline leaks or spills, old paint chips, and other chemicals and products with lead. There are still some pipes and soldering that contain lead, which can enter our drinking water, glazed pottery made with lead, as well as metal jewelry, older painted wooden and metal toys, and imported makeup, candy, nutritional supplements, and spices.

The most common source of lead exposure to children in the US is from dust and soil contaminated with paint from pre-1978 housing. Drinking water is not the major source of exposure to lead for most people in the US. However, drinking water can make up 20 percent or more of a person's total exposure to lead, and this can be higher for young infants who consume mostly formula made with tap water. Lead poisoning is preventable. Removing potential sources of lead and avoiding sources of lead are the main prevention. Following healthy nutrition also helps minimize the severity of lead poisoning.

Lead can be found throughout a child's environment.

1 Homes built before 1978 (when lead-based paints were banned) probably contain lead-based paint.

2 Certain water pipes may contain lead.

3 Lead can be found in some products such as toys and toy jewelry.

4 Lead is sometimes in candies imported from other countries or traditional home remedies.

5 Certain jobs and hobbies involve working with lead-based products, like stain glass work, and may cause parents to bring lead into the home.

When the paint peels and cracks, it makes lead dust. Children can be poisoned when they swallow or breathe in lead dust.

There is no safe level of lead in any produce or in your drinking water. No amount of lead in your body is considered safe or normal. Once lead gets into the body, it mainly effects the nervous system. It has the biggest effect on those whose nervous systems are still developing, like young children or unborn fetuses. Long-term exposure to lead can cause poor learning, decreased intelligence, poor memory, and attention, as well as weakness. Lead can also cause anemia, kidney damage, high blood pressure, premature births, and miscarriage. Most children with elevated lead levels do not have any signs of illness.

Although there is no safe level of lead, the CDC has identified a blood lead reference value (BLRV) to identify children with higher levels of lead in their blood compared to most children. This level is based on the 97.5th percentile of blood lead values among U.S. children ages 1 to 5 years from 2015 to 2018 studies. This value, which is a venous lead level of or over 3.5 micrograms per deciliter ($\mu\text{g}/\text{dL}$), would represent blood lead levels that are in the top 2.5% of the highest lead levels in the U.S. In 2012, the first BLRV was established at 5 $\mu\text{g}/\text{dL}$ based on data from 2007 to 2010. Prior to that, levels over 10 $\mu\text{g}/\text{dL}$ were considered “levels of concern”. Studies have found that even low levels of lead, those under 10 $\mu\text{g}/\text{dL}$, had significant impacts on childhood neurocognitive development.

Testing lead levels is required at 12 and 24 months for children on Medicaid or certain other high-risk factors and recommended for children with identified risks for lead poisoning. Since the BLRV has been decreased to 3.5, an increase in the number of children with elevated blood lead levels that need evaluation and management is expected.

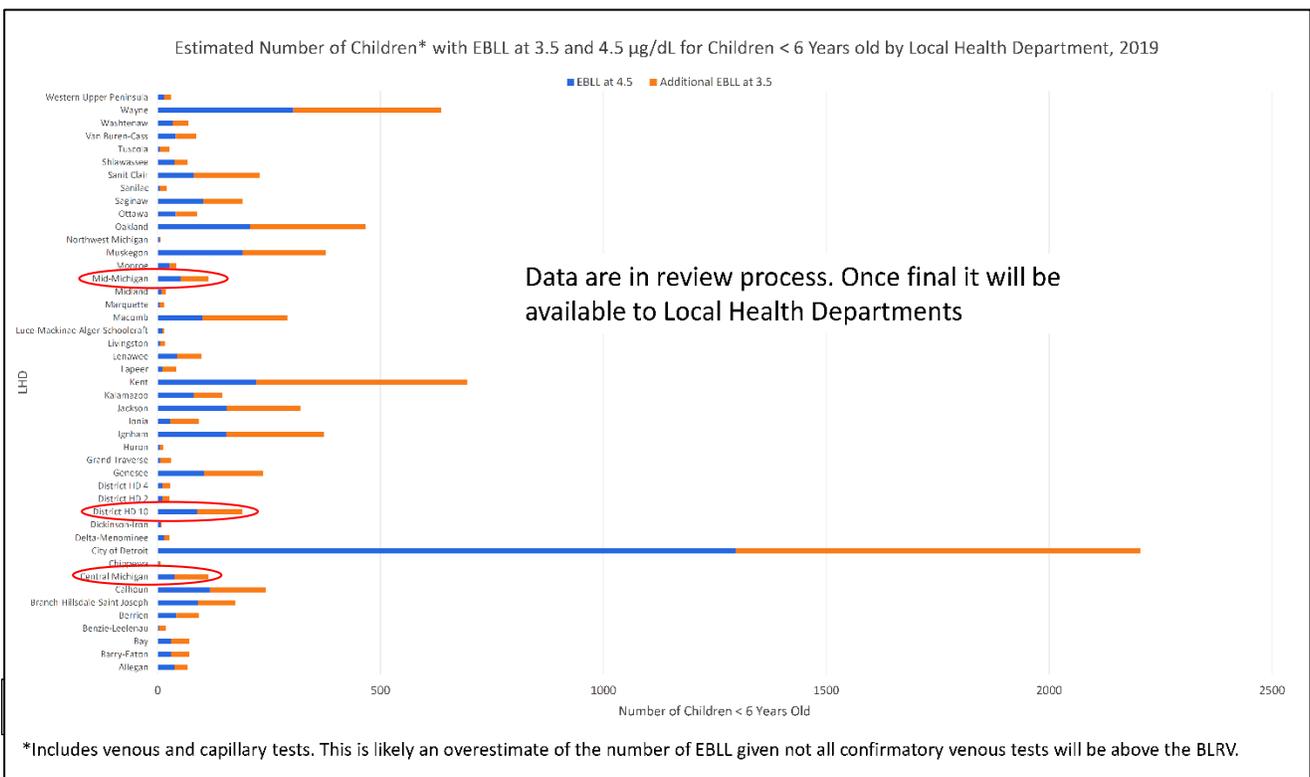
TABLE 1. Definitions for interpreting children’s blood lead levels — United States, 1960–2021

Year	Blood lead level ($\mu\text{g}/\text{dL}$)	Interpretation*
1960	60	NA
1970	40	Undue or increased lead absorption
1975	30	Undue or increased lead absorption
1978	30	Elevated blood lead level
1985	25	Elevated blood lead level
1991	10	Level of concern
2012	5	Reference value
2021	3.5	Reference value

Abbreviation: NA = not available.

* <https://stacks.cdc.gov/view/cdc/61820>

Ruckart PZ, Jones RL, Courtney JG, et al. Update of the Blood Lead Reference Value — United States, 2021. MMWR Morb Mortal Wkly Rep 2021;70:1509–1512. DOI: <http://dx.doi.org/10.15585/mmwr.mm7043a4>



Below is a summary of the evaluation and management of elevated lead levels in children.

BLOOD LEAD LEVEL (BLL) QUICK REFERENCE FOR PRIMARY CARE PROVIDERS				
Medicaid requires all children to be tested at 12 and 24 months of age. Children between 36 and 72 months who were not previously tested must be tested at least once.				
	BEST PRACTICE	CONSIDERATIONS/TREATMENT	RETESTING	ANTICIPATORY GUIDANCE AND REFERRALS
NOT YET TESTED		<ul style="list-style-type: none"> Conduct the risk assessment on the other side of this document Test based on Medicaid requirements or risk assessment results 		<ul style="list-style-type: none"> Provide education about nutrition and lead exposure prevention
BLL < 3.5 µg/dL	<ul style="list-style-type: none"> Review lead level with family 	<ul style="list-style-type: none"> The limit of detection for lead can vary by lab method and is typically between 1 and 3.3 µg/dL 	<ul style="list-style-type: none"> Retest in 6-12 months if child is at high risk If child tested at age < 12 months, retest in 3-6 months 	
BLL 3.5-14 µg/dL	<ul style="list-style-type: none"> Confirm capillary result with venous test Review lead level with family 	<ul style="list-style-type: none"> Conduct environmental history Consider other children who may be exposed Review diet for calcium and iron Ensure iron sufficiency with laboratory testing Perform developmental screening 	<ul style="list-style-type: none"> Venous retest within 1-3 months to ensure BLL is not rising If it is stable or decreasing, retest in 3 months 	<ul style="list-style-type: none"> Provide education about nutrition and lead exposure prevention
BLL 15-44 µg/dL	<ul style="list-style-type: none"> Confirm capillary result with venous test Review lead level with family 	<ul style="list-style-type: none"> Follow guidance above for 3.5-14 µg/dL Consider abdominal xray if ingested lead is suspected 	<ul style="list-style-type: none"> Venous retest within 2-4 weeks, more rapidly at higher levels Repeat every 1-3 months until levels are < 3.5 µg/dL 	<ul style="list-style-type: none"> Refer family to local health department for linkage to services Refer family to Lead Safe Home Program to determine eligibility for environmental investigation and abatement
BLL 45+ µg/dL	<ul style="list-style-type: none"> Confirm capillary result with venous test as soon as possible within 48 hours Review lead level with family 	<ul style="list-style-type: none"> Follow guidance above for 15-44 µg/dL Any treatment at this level should be performed in consultation with MI Poison Control 800-222-1222 Consider hospitalization and/or chelation Family should NOT return to lead-contaminated home 	<ul style="list-style-type: none"> Confirm initial BLL with venous repeat as soon as possible within 48 hours Retesting as directed by expert 	<ul style="list-style-type: none"> For children < 3 years refer to Early On

BLOOD LEAD RISK ASSESSMENT

Medicaid Requirements: All children covered by Medicaid are considered at high risk for lead exposure. Medicaid requires all children to be tested at 12 and 24 months of age. Children between 36 and 72 months, who were not previously tested, must be tested at least once.

All children under 6 years old (72 months) should be assessed for risk of lead poisoning using the following questions:

- ◆ Does the child live in or regularly visit a home built before 1978? (Note: recent or planned renovations can greatly increase risk of lead exposure in homes built before 1978)
- ◆ Does the child live in or regularly visit a home that had a water test with high lead levels?
- ◆ Does the child have a brother, sister, or friend that has an elevated blood lead level?
- ◆ Does the child come in contact with an adult whose job or hobby involves exposure to lead (e.g., smelting, indoor shooting/firing ranges, pottery, stained glass, refinishing old furniture)?
- ◆ Does the child's caregiver use home remedies (e.g., ba-baw-san, daw tway, greta, azarcon, balguti kesaria, ghasard) or imported spices that may contain lead?
- ◆ Is the child in a special population group such as foreign adoptee, refugee, migrant, immigrant, or foster child?
- ◆ Does the child's caregiver have reason to believe the child is at risk for lead exposure (e.g., exhibiting pica behavior, developmental delays)?

If answered YES or DON'T KNOW to any of these questions, lead testing is recommended.

To learn more about lead poisoning prevention and blood lead testing, contact the Childhood Lead Poisoning Prevention Program:

517-335-8885 or Michigan.gov/MiLeadSafe

Also see: AAP Council on Environmental Health. Prevention of Childhood Lead Toxicity. Pediatrics. 2016; 138(1):e20161493.DOI: 10.1542/peds.2016-1493

Recommendations:

1. Be aware of the potential sources of lead exposure which can include the soil, dust, old paints, older pipes and soldering, which can enter our drinking water, some glazed pottery, metal jewelry, older painted wooden and metal toys, and imported makeup, candy, nutritional supplements, and spices.
2. Be sure 12- and 24-month-old children are at least assessed for risk of lead poisoning using a targeted screening questionnaire and preferably receive universal blood lead level testing. If their screening (capillary) level is 3.5 or above, have it confirmed by a blood draw (venous blood test).
3. Be aware of the new lower level defining an elevated blood lead level in children.

Resources:

- MI Lead Safe <https://www.michigan.gov/mileadsafe/>
- Childhood Lead Poisoning Prevention Program <https://www.cdc.gov/nceh/lead>
- 10 Policies to Prevent and Respond to Childhood Lead Exposure https://nchh.org/resource-library/hip_10-policies-to-prevent-and-respond-to-childhood_lead_exposure_english.pdf
- United States Consumer Product Safety Commission (search “lead” under HAZARD) <https://www.cpsc.gov/Recalls>
- A Healthy Home for Everyone: The Guide for Families and Individuals https://www.cdc.gov/nceh/lead/docs/publications/final_companion_piece.pdf
- Lead Poisoning Words to Know from A to Z https://www.cdc.gov/nceh/lead/docs/LeadGlossary_508.pdf
- National Lead Poisoning Prevention Week Partner Information Kit, 2021 https://www.hud.gov/sites/dfiles/HH/documents/NLPPW_2021_Partner_Information_Kit.pdf
- Training opportunities for lead inspections or abatement https://www.michigan.gov/mileadsafe/0,9490,7-392-84218_104618---,00.html

Sources:

- Agency for Toxic Substance and Disease Registry. 2020. ToxFAQs™ for Lead. <https://www.cdc.gov/TSP/ToxFAQs/ToxFAQsDetails.aspx?faqid=93&toxid=22>
- Ruckart PZ, Jones RL, Courtney JG, et al. Update of the Blood Lead Reference Value — United States, 2021. MMWR Morb Mortal Wkly Rep 2021;70:1509–1512. DOI: <http://dx.doi.org/10.15585/mmwr.mm7043a4>
- McDonald, J. 2022. Blood Lead Reference Value Update: Implications for Public Health in Michigan. Division of Environmental Health, MDHHS