

# Clinical Management of Pediatric Patients with Elevated Blood Lead Levels

In the State of Kansas



**This factsheet has been designed for lead exposure screening of asymptomatic children. If a child is symptomatic for heavy metal poisoning, clinical management will differ from the recommendations on this fact sheet.**

## Risk Factors for Lead

Use this list for screening and anticipatory guidance.

- Immigration and refugee status.
- Living near a contamination source and/or living near high-risk area.
- Adult in the home with occupational & recreational exposures that bring lead dust into the home (may include welding, auto mechanics, battery manufacturing, art, construction, demolition, gun handling [or ammunition], and others).
- Use of lead-glazed ceramic pottery.
- Pica – eating nonfood substances such as ceramic pieces or dirt.
- Folk remedies or alternative therapies (such as azarcon, kohl, kajal, surma, & many others).
- Imported products such as cosmetics, candy, and spices.
- Renovating/remodeling pre-1978 homes.
- Any contact with old paint and paint-dust.
- Contaminated drinking water, from lead service lines, solder or other sources; may include well-water.
- Poor diet, cigarette, and alcohol use.
- History of previous lead exposure.
- House member or regular play partner with an elevated lead level.

## Timeline and Process

### Responding to an abnormal Blood Lead Level (BLL)

1. Identify Risk Factors (see list above) and test if positive for risk factors. Children 12 and 24 months old on Medicaid are required to be tested with at least one test conducted prior to 6 years of age (more testing may be necessary in high-risk areas) require testing.
2. Obtain either a capillary or venous sample, capillary results  $\geq 3.5\text{mcg/dL}$  must be confirmed with a venous sample.
3. All Laboratory (or clinic) test results for blood lead levels must be reported to the Kansas Department of Health and Environment (KDHE) within 24 hours in Kansas.
4. Local health departments in Kansas are provided access to their respective jurisdiction's blood lead testing results. Results that are  $\geq 3.5\text{mcg/dL}$  are considered to be elevated per CDC guidelines. Local health departments will conduct limited elevated blood lead case investigations based on current disease investigation guidelines. Public health surveillance is conducted by KDHE and the local health department.
5. The individual's provider or clinician is responsible for monitoring the elevated blood lead levels to ensure that blood lead levels decrease over time and to provide patient care recommendations. A continued increase may indicate unidentified sources of lead exposure. Open communication between clinician and public health is advised.

Capillary BLL	Confirm with vBLL	Venous BLL	Follow up vBLL testing: frequency after confirmation venous test for 2-4 tests	Clinical Management
≥ 3.5ug/dL		≥ 3.5ug/dL	Retest 3 months, 1 and 2 years of age and for cases with known risk factors for lead exposure.	Anticipatory guidance; follow up with screening at 12 and 24 months of age; Repeat in 6-12 months if child is at high risk. Perform routine health maintenance and testing. Promote adequate nutrition with vitamin C and iron. Identify and eliminate any sources of lead in the patient's home (see list below for common sources of lead).
≥ 5-14 mcg/dL	1-3 months	≥ 5-14 mcg/dL	Retest within 1-3 months to ensure BLL not rising and trending down.	All above recommendations and: Take careful environmental history to identify potential sources; advise about removing sources. Provide guidance on below interventions (nutritional, cognitive development). Provide structured developmental screening. Rule out iron deficiency (w/ CBC, ferritin, CRP); Prescribe iron if needed.
≥ 15-44 mcg/dL	1 week-1 month	≥ 15-44 mcg/dL	Retest in 1-4 weeks to ensure BLL not rising and trending down.	All above recommendations and: Consider abdominal X-ray for possible gut decontamination based on history and possible ingestion. Chelation is not recommended for BLL less than 44; there is no proven evidence for improved cognitive outcomes for chelation of these BLLs. *Consult with expert for clinical guidance, such as Mid-America Pediatric Specialty Unit (MAPEHSU) ( <a href="mailto:MAPEHSU@cmh.edu">MAPEHSU@cmh.edu</a> ).
>44 mcg/dL	48 hours *Results ≥70 test immediately	>44 mcg/dL	Retest in 1-2 weeks and repeat 1-2 weeks after chelation; then ensure downward trending results every 3 months. *≥70 retest after first venous test in 48 hours, then repeat 1-2 weeks after chelation for downward trend (same as above).	All above recommendations and: Consider hospitalization. Initiate chelation in consultation with experienced clinician ( <a href="mailto:MAPEHSU@cmh.edu">MAPEHSU@cmh.edu</a> ) . Ensure child discharged to lead free environment and a home assessment is completed.  *≥70 Emergency. Hospitalize patient. Contact MAPEHSU and/or toxicologist for immediate consultation on therapy. Do not chelate without experienced provider. Stop iron therapy prior to chelation. Ensure child discharged to lead free environment and home assessment is completed. To identify and reduce further lead exposure.

## Preventive Measures / Anticipatory Guidance

**\*\*Identify and eliminate the sources of lead exposure, reassess high risk patients routinely for changes in housing, behavior and circumstance.**

### Nutrition and routine health maintenance:

- Assess for iron deficiency and anemia, treat accordingly.
  - Supplement iron and vitamin C.
  - Ensure adequate nutrition.
  - Because lead shares common metabolic pathways with iron, calcium, vitamins C and D, zinc, and magnesium, nutritional deficiencies in these minerals promote lead absorption and must be treated.
- Refer families to SNAP, WIC, or other nutritional resources if needed.

### Neurocognitive Evaluations:

- Assess developmental milestones, establish a low threshold for referral to education enrichment programs (such as Head Start, Kansas Infant-Toddler Services, or other early intervention programs). The neurocognitive effects of lead may manifest over years and early management is important for mediating these effects.
  - Perform a structured developmental screening at each child maintenance visit.
  - Promote daily physical activity in children and other routine health promotion behaviors.

### Ways to Reduce Lead Exposure at Home:

- This [link](#) has safe cleaning practices for parents.
- Use a damp rag and mop to wipe down surfaces where dust might be.
- Avoid DIY home renovations in pre-1978 homes, which generate lead dust.
- Adults who work in an environment with lead exposure should keep work clothes and shoes separate. Recommend bathing before interacting with children.
- Promote regular hand washing.

### References

- Advisory Committee on Childhood Lead Poisoning Prevention. (2012, January 4). Low level lead exposure harms children: A renewed call for primary prevention [PDF]. Centers for Disease Control and Prevention. [https://www.cdc.gov/nceh/lead/ACCLPP/Final\\_Document\\_030712.pdf](https://www.cdc.gov/nceh/lead/ACCLPP/Final_Document_030712.pdf)
- American Academy of Pediatrics. (2017, August 30). Blood lead levels in children: What parents need to know. HealthyChildren.org. <https://www.healthychildren.org/English/safety-prevention/all-around/Pages/Blood-Lead-Levels-in-Children-What-Parents-Need-to-Know.aspx>
- Centers for Disease Control and Prevention. (2020a, April 7). Sources of Lead. Childhood Lead Poisoning and Prevention. <https://www.cdc.gov/nceh/lead/prevention/sources.htm>
- Centers for Disease Control and Prevention. (2020b, October 9). How much physical activity do children need? <https://www.cdc.gov/physicalactivity/basics/children/index.htm>
- Centers for Disease Control and Prevention. (2021, March 19). Childhood lead poisoning prevention program. CDC. <https://www.cdc.gov/nceh/lead/default.htm>
- Hauptman, M., MD, MPH, Bruccoleri, R., MD, & Woolf, A. D., MD, MPH. (2017, September 17). An update on childhood lead poisoning [PDF]. HHS Public Access. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5645046/pdf/nihms904604.pdf>
- Pediatric Environmental Health Specialty Units. (2013). Recommendations on Medical Management of Childhood Lead Exposure and Poisoning [PDF]. [https://doi.org/https://www.pehsu.net/\\_Library/facts/medical-mgmt-childhood-lead-exposure-June-2013.pdf](https://doi.org/https://www.pehsu.net/_Library/facts/medical-mgmt-childhood-lead-exposure-June-2013.pdf)
- Pediatric Environmental Health Specialty Units. (2016). PEHSU Factsheet on Lead and Drinking Water: Information for Health Professionals Across the United States [PDF]. [https://www.pehsu.net/\\_Library/facts/LeadandDrinkingWater\\_62116\\_final.pdf](https://www.pehsu.net/_Library/facts/LeadandDrinkingWater_62116_final.pdf)

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