



**Chester County Health Department
Blood Lead Level Guidance**

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Venous Level	Healthcare Provider Management & Monitoring	Health Department Management
<1 µg/dL	<ul style="list-style-type: none"> Advise on sources of exposure and adequate iron and calcium intake. Capillary lead test at 12 months and 24 months. See notes for children at high risk. 	<ul style="list-style-type: none"> No action
1 to 4.9 µg/dL	<ul style="list-style-type: none"> Assess for sources of exposure and adequate iron and calcium intake. Annual blood lead testing through age 6 years. Assess for developmental or behavioral problems. 	<ul style="list-style-type: none"> No action
5 to 9 µg/dL	<ul style="list-style-type: none"> Assess for sources of exposure and adequate iron and calcium intake. Test other children under 6, pregnant women, and lactating women in household. Retest every 3 months until blood lead level (BLL) declines, then every 6-9 months until 2 consecutive tests are below 5 µg/dL. Subsequently, continue routine monitoring as in 1 to 4.9 µg/dL. 	<ul style="list-style-type: none"> Send educational information to family and copy primary care provider (PCP) to letter. Encourage parent to contact Early Intervention (EI).
10 to 19 µg/dL Note: For 2 consecutive 15-19 µg/dL tests use protocol for 20-24 µg/dL	<ul style="list-style-type: none"> Same as above plus order lab work to assess iron status (e.g. complete blood count (CBC), ferritin). Retest every 1-3 months until BLL declines, then every 3-6 months until 2 consecutive tests are below 5 µg/dL. Subsequently, continue routine monitoring as in 1 to 4.9 µg/dL. 	<ul style="list-style-type: none"> If 10-14, send educational information to family and copy PCP to letter. Encourage parent to contact EI. ----- If 15-19, same as above, plus nurse interviews family over phone and refers to EI.
20 to 24 µg/dL	<ul style="list-style-type: none"> Same as above plus order abdominal x-ray (with bowel decontamination if needed), and neuro-developmental assessment. Retest every 1-3 months until 2 tests ≥ 3 months apart are below 5 µg/dL. Subsequently, continue routine monitoring as in 1 to 4.9 µg/dL. 	<ul style="list-style-type: none"> Send educational information to family and PCP. Home visit by nurse to complete a developmental assessment. Refer to EI. Refer for environmental investigation.
25-44 µg/dL	<ul style="list-style-type: none"> Retest every 2 weeks until BLL declines, then every month until 2 tests ≥ 3 months apart are below 5 µg/dL. Subsequently, continue routine monitoring as in 1 to 4.9 µg/dL. 	<ul style="list-style-type: none"> Same as above
45 to 69 µg/dL	<ul style="list-style-type: none"> Refer to/consult with an experienced provider to begin treatment with oral chelation therapy within 48 hours (see notes). Consider hospitalization if lead-safe environment cannot be assured. Continue frequent retesting until test is below 45 µg/dL, then follow intervals for ≥ 25 µg/dL. Subsequently, continue routine monitoring as in 1 to 4.9 µg/dL. 	<ul style="list-style-type: none"> Contact family and copy PCP within 1 business day to initiate home visit for developmental assessment, referral to EI, referral for environmental investigation.
≥ 70 µg/dL	<ul style="list-style-type: none"> Hospitalize for medical emergency requiring immediate treatment. Consult pediatric toxicologist or environmental health specialist. Continue frequent retesting until test is below 45 µg/dL, then follow intervals for ≥ 25 µg/dL. Subsequently, continue routine monitoring as in 1 to 4.9 µg/dL. 	<ul style="list-style-type: none"> Contact family and copy PCP within 1 business day to initiate home visit for developmental assessment, referral to EI, referral for environmental investigation.

Elevated Capillary Test Follow-up Period

Capillary Results	Venous Level Needed
5-19 µg/dL	Within 1 Month
20-44 µg/dL	Within 1 Week
45-69 µg/dL	Within 24 Hours
≥ 70 µg/dL	IMMEDIATELY



NOTES

- Though $<5 \mu\text{g}/\text{dL}$ is commonly reported as the “normal range,” there is no known safe level of lead. The upper value of the reference range was established by the CDC in 2012 at $5 \mu\text{g}/\text{dL}$ based on population BLLs. Permanent neurologic damage and behavioral disorders are associated with BLLs at or below $5 \mu\text{g}/\text{dL}$, therefore any blood lead level > 0 warrants follow-up. The CDC is expected to report a new reference value based on more recent evidence.
- Capillary testing should only be used for screening. Any elevation should be confirmed with a venous blood lead level. In the event that the family is unable to obtain venous testing after PCP has made repeated attempts to encourage follow-up, repeat capillary testing, which will at least provide an approximate BLL, is better than no further monitoring.
- More frequent testing may be warranted in certain situations, such as:
 - new patients, to ensure blood lead levels are not rising quickly
 - a child screened at less than 12 months, whose increased mobility may increase exposure
 - patients tested in winter months, because BLL tends to rise during warmer months
 - patients at high risk of ongoing exposure.
- In addition to routine capillary testing of blood lead levels at 12 months and 24 months, children who may have higher risk of lead exposure should have risk assessments or capillary tests performed at ages 6 months, 9 months, 18 months, 3 years, 4 years, 5 years, and 6 years,. BLL should always be obtained for any positive risk assessment, with further action based on the table above. Any detectable BLL (higher than $0 \mu\text{g}/\text{dL}$) indicates all subsequent assessments should be capillary testing, which are more accurate than questionnaires and clinical decision tools. Populations at higher risk include:
 - low socioeconomic status families
 - members of racial or ethnic minority groups
 - recent immigrants, refugees, or international adoptees
 - people living in older or poorly maintained housing
 - children whose parents have lead exposure through work or hobbies.
 - Risk Assessments should include questions relating to:
 - housing built prior to 1978
 - lead service lines or known lead in water
 - family member with elevated BLLs
 - consumption of alternative remedies and/or internationally obtained candies and/or spices
 - excessive mouthing habits
 - family member’s job or hobbies that may increase exposure to lead, including but not limited to: home repair/renovation; automotive repair; battery manufacturing and recycling; highway and bridge painting; use or production of firearms and ammunition; plumbing; working in or around metal foundries or smelters; painting, making, blowing, or recycling stained glass; making pottery or ceramic ware; liquor distillation.
- Prior to initiating oral chelation therapy, baseline studies of serum electrolytes, calcium, magnesium, BUN, creatinine, AST, ALT, free erythrocyte protoporphyrin, G6PD deficiency screening, iron, total iron binding capacity, transferrin saturation, and urinalysis should be obtained. A head CT or other neuroimaging is indicated in patients with encephalopathy.
- Further information: National Lead Information Center (800-424-LEAD); Pediatric Environmental Health Specialty Unit (PEHSU) Mid-Atlantic referral center at Georgetown University Medical Center (866-622-2431); Poison Control Center (800-222-1222)
- Local referrals: Penn Medicine Chester County Hospital (610-431-5000); Nemours AI DuPont Hospital for Children (302-651-4000); Children’s Hospital of Philadelphia (800-879-2467)
- These actions are NOT recommended:
 - searching for gingival lead lines
 - testing neurophysiologic or renal function
 - testing hair, teeth, or fingernails for lead
 - x-rays or x-ray fluorescence of long bones
 - chelation therapy for BLL $< 45 \mu\text{g}/\text{dL}$.

Abbreviations: ALT – alanine aminotransferase, AST – aspartate aminotransferase, BLL – Blood lead level, BUN – blood urea nitrogen, CBC – complete blood count, CDC – Centers for Disease Control and Prevention, CT – computed tomography, EI – Early Intervention, G6PD – glucose-6-phosphate dehydrogenase, PCP – primary care provider.