

# Lead Exposure in Children

## Public Health Case Management Guidelines

- Case management is indicated for children with blood lead levels (BLL)  $\geq 3.5$   $\mu\text{g}/\text{dL}$ .
- Case management includes communication and coordination of services and family needs between caregivers, providers, and public health.
- Goal: Reduce the blood lead level by reducing/eliminating exposures and hazards in the child's environment.

### Suspect Cases (Initial Unconfirmed Capillary BLL)

BLL	Recommended Actions for Initial Capillary BLL
$\geq 3.5$ $\mu\text{g}/\text{dL}$	<p><b>Within 1 month</b></p> <p><b>Notify the parent or caregiver:</b> Phone call (or letter) with BLL results and confirmatory test recommendations.</p> <p><b>Contact the family and/or provider</b> if confirmatory test not completed within recommended timeframe.</p>

### Confirmed Cases (Venous BLL)

BLL	Recommended Actions for Initial Confirmatory or Venous BLL
3.5 – 9 $\mu\text{g}/\text{dL}$	<p><b>Within 1 month</b></p> <p><b>Notify the caregiver:</b> Contact family with BLL results and follow-up testing recommendations.</p> <p><b>Provide health education:</b> Send educational materials to family about exposure sources and prevention.</p> <p><b>Obtain environmental history:</b> Interview caregiver to assess the child's environmental history and risk factors. Recommend ways to prevent further lead exposure based on risk factors.</p> <p><b>Contact the healthcare provider:</b> Initiate contact with provider to discuss medical management and case coordination. Follow-up with provider to communicate case management activities and investigation findings.</p> <p><b>Refer the family to developmental programs and community resources:</b> Make referrals as needed to: healthcare providers' office, early intervention and/or other early childhood programs, health, nutrition counseling or WIC, and housing and/or social services when appropriate.</p> <p><b>Ensure follow-up test scheduled within 3 months:</b> Contact healthcare provider and/or family if follow-up test not completed within 3 months.</p>
10 – 19 $\mu\text{g}/\text{dL}$	<p><b>Within 2 weeks</b></p> <p><b>Same actions as above for 3.5-9 <math>\mu\text{g}/\text{dL}</math>, plus:</b></p> <p><b>Arrange on-site environmental investigation and educational home visit:</b> Environmental investigation of the home to identify potential sources of lead. Recommend ways to prevent further lead exposure.</p> <p><b>Assess family needs:</b> Assess the child's status and needs (medical, environmental, nutritional, developmental, housing, and social services).</p> <p><b>Develop a case management plan:</b> Collaborate with the family, physicians, and other providers to develop an appropriate plan based on the needs assessment. Include all necessary referrals in the plan.</p>
20 – 44 $\mu\text{g}/\text{dL}$	<p><b>Within 1 week</b></p> <p><b>Same actions as above for 10-19 <math>\mu\text{g}/\text{dL}</math>, plus:</b></p> <p><b>Ensure follow-up test scheduled within 2-4 weeks:</b> Higher BLLs (<math>\geq 25</math> <math>\mu\text{g}/\text{dL}</math>) may require more frequent monitoring. Contact healthcare provider and/or family if follow-up test is not completed within 4 weeks.</p>
$\geq 45$ $\mu\text{g}/\text{dL}$	<p><b>Within 2 days</b></p> <p><b>Same actions as above for 20-44 <math>\mu\text{g}/\text{dL}</math>, plus:</b></p> <p><b>Chelation treatment:</b> Chelation therapy is indicated. Discuss treatment with healthcare provider. Chelation should be done in consultation with an expert. Contact Pediatric Environmental Health Specialty Unit (1-800-421-9916) or Poison Control Center (1-800-222-1222).</p> <p><b>Facilitate alternative lead-safe housing:</b> A lead-safe environment must be assured before chelation.</p>

## Definitions

<b>Blood Lead Reference Level</b>	The CDC blood lead reference value is 3.5 micrograms per deciliter (µg/dL).
<b>Elevated BLL</b>	Any blood lead level (BLL) at or above the blood lead reference level.
<b>Suspect or Unconfirmed Blood Lead Case</b>	Child with a single capillary blood lead test $\geq 3.5$ µg/dL.
<b>Confirmed Blood Lead Case</b>	Child with at least one venous BLL $\geq 3.5$ µg/dL OR two capillary BLLs $\geq 3.5$ µg/dL drawn within 12 weeks of each other.

## Recommended Schedules for Confirmation and Follow-up Testing

Schedule for Confirmatory BLL		Schedule for Follow-up BLLs		
Initial Capillary BLL (µg/dL)	Confirm with Venous Blood Test	Confirmed BLL (µg/dL)	Retest first 2-4 tests	Retest after BLLs declining
3.5 – 9	Within 3 months*	3.5 – 9	3 months*	6–9 months
10 – 19	Within 1 month*	10 – 19	1–3 months*	3–6 months
20 – 44	Within 2 weeks*	20 – 44	2–4 weeks	1–3 months
$\geq 45$	Within 24 - 48 hours*	$\geq 45$	As soon as possible. Consult with expert.	
*The higher the BLL on a screening test, the more urgent the need for confirmatory testing.		*Some providers may choose to repeat BLL within a month to ensure the level is not rising more quickly than anticipated.		

## Case Management for Elevated Blood Lead Levels

The case manager should develop a plan with the family that describes the steps needed to lower the blood lead level, prevent re-exposure, and identify services needed to treat/manage lead in blood. Note: The case manager does not need to directly provide all follow-up services but should ensure that services are provided. Areas of the plan should cover the following:

1. Identification/reduction/elimination of environmental hazards
  - Assessment of all possible exposure sources.
  - Assist with short-term hazard reduction (i.e. temporary relocation to lead-safe housing if needed).
  - Assist with long-term hazard eliminations (including permanent relocation to lead-safe housing if needed).
  - Identification and removal of non-residential exposures (i.e. alternative medicines, spices, take-home exposures from parent’s occupation).
2. Caregiver lead education
  - Counselling on decreasing identified exposure risks, cleaning practices, importance of follow-up blood lead tests
3. Improvement of nutrition
  - Caregiver nutritional counselling. Referral to WIC, SNAP, or other community food resources.
4. Medical follow-up care
  - Follow-up blood lead testing to ensure BLL is declining.
  - Testing siblings or other at-risk children living in home.
  - Follow-up visits with child’s healthcare provider.
5. Referrals and follow-up of other identified problems
  - Referral or follow-up: medical services, developmental assessment, early intervention if developmental delays suspected or diagnosed, home visitation, head start, housing services, social services, transportation, legal services.

## Additional Resources

- CDC [Recommended Actions Based on Blood Lead Levels](#).
- Pediatric Environmental Health Specialty Units, 2021. [Management of Childhood Lead Exposure](#).
- AAP, 2016. [Prevention of Childhood Lead Toxicity](#). Pediatrics. 2016;138(1):e20161493.
- National Toxicology Program. 2012. [Monograph on Health Effects of Low-Level Lead](#).