BACKGROUND

Approximately 250,000 U.S. children aged 1-5 years have blood lead levels greater than 10 micrograms of lead per deciliter of blood, the level at which the Centers for Disease Control and Prevention (CDC) recommends public health actions be initiated. Lead poisoning can affect nearly every system in the body. Because lead poisoning often occurs with no obvious symptoms, it frequently goes unrecognized. (CDC, 2012). Children under the age of 6 are most at risk because they are growing so rapidly and because they tend to put their hands or other objects, which may be contaminated with lead dust, into their mouths. However, children living at or below the poverty line who live in older housing are at greatest risk. Additionally, children of some racial and ethnic groups and those living in older housing are disproportionately affected by lead. (CDC, 2012).

Screening Recommendations for Pediatricians

The U.S. Preventive Services Task Force (USPSTF) (2006) concludes that evidence is insufficient to recommend for or against routine screening for elevated blood lead levels in asymptomatic children aged 1 to 5 who are at increased risk. (Grade: I – insufficient evidence to make a recommendation). The USPSTF (2006) recommends against routine screening for elevated blood lead levels in asymptomatic children aged 1 to 5 years who are at average risk. (Grade: D – fair evidence exists that screening is ineffective or that harms outweigh benefits).

The American Academy of Pediatrics (AAP) recommends that pediatricians learn whether city or State health departments provide guidance for screening children who are not eligible for Medicaid. If no such guidance is available, the AAP recommends that pediatricians consider screening all children. Children should, ideally, be tested at 1 and 2 years of age. (USPSTF, 2006).

The two most common methods of screening children for lead poisoning are venous blood sampling (inserting a needle into a vein) and capillary blood sampling (finger or heel stick). The venous method is more accurate, but capillary screening is often the easiest way to screen young children. The capillary screening test can be performed in the physician’s office and costs about $6; lab analysis is less than $20. (NCQA, 2010).

The AAP (2005) further suggests the following:

- Provide anticipatory guidance to parents of infants and toddlers aged 6 months to 3 years about preventing lead poisoning. Parents should be made aware of normal mouthing behavior and should assess the safety of their home, work and hobbies. Inform parents that lead can be present in dust and can be ingested by hand to mouth contact.
• Inquire about lead hazards in home, child care settings; inspections may warrant repairs by certified individuals.

• Know state Medicaid regulations and measure blood lead concentration in Medicaid-eligible children. Find guidance from city or state health departments about screening in non-Medicaid-eligible children.

• Be aware of local special risk groups (e.g., immigrants, foreign-born adoptees, refugees, children whose parents have an occupation or hobby that may be at risk for lead exposure).

• Acquire updates from the National Advisory Committee on Childhood Lead Poisoning Prevention and other groups.

The American Academy of Family Physicians (AAFP) recommends screening 12-month-old infants for lead poisoning if they live in communities in which the prevalence of lead levels requiring intervention is high or undefined; if they live in or frequently visit a home built before 1950 that has dilapidated paint or recent or ongoing renovations or remodeling; if they have close contact with a person who has an elevated blood lead level or who lives near lead industry or heavy traffic; or if they live with someone whose job or hobby involves lead exposure, uses lead-based pottery, or takes traditional remedies that contain lead. (USPSTF, 2006).

Medicaid's Early and Periodic Screening, Diagnostic, and Treatment Program requires that all children receive a screening blood lead test at 12 months and 24 months of age; children between the ages of 36 months and 72 months of age must receive a screening blood lead test if they have not been previously screened. (USPSTF, 2006).

Treatment options in use for elevated blood lead levels include residential lead hazard-control efforts (ie, counseling and education, dust or paint removal, and soil abatement), chelation, and nutritional interventions. In most settings, education and counseling is offered for children with blood lead levels from 10 to 20 µg/dL. Some experts have also recommended nutritional counseling for children with blood lead levels in this range. Residential lead hazard control is usually offered to children with blood lead levels ≥20 µg/dL, while chelation therapy is offered to children with blood lead levels ≥45 µg/dL. (USPSTF, 2006).

Screening Recommendations for Pregnant Women

The USPSTF (2006) recommends against routine screening for elevated blood lead levels in asymptomatic pregnant women (Grade: D – fair evidence exists that screening is ineffective or that harms outweigh benefits). No national organizations currently recommend screening pregnant women for elevated lead levels.

Suggested Clinical Evaluation for Lead Exposure

(Source: AAP, 2005)

Medical History: Ask about symptoms, development history, mouthing activities, pica, previous blood lead concentration measurements, family history of lead poisoning.

Environmental History

Paint and Soil Exposure: Items to consider are age and condition of residence, evidence of chewed or peeling paint, how long has family been at current residence, renovation and repair history of house, newness of windows, other sites where child spends a significant amount of time, condition of indoor play areas, bare soil exposure in outdoor play areas, attempts to control dust and dirt.

Relevant Behavioral Characteristics: Hand to mouth activity by the child (e.g., before meals, snacks), exhibition of pica.

Exposures and Behaviors of Household Members: Occupations and hobbies of household members, painted or unusual items burned in household fireplaces.
**Miscellaneous:** Homes containing vinyl mini-blinds made overseas and purchased before 1997; child access to imported food, cosmetics, or folk remedies; food prepared or stored in imported pottery or metal vessels; use of imported foods in soldered cans; candies imported from Mexico.

**Nutritional History:** Take a dietary history, evaluate child’s iron status, ask about history of food stamps or participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

**Physical Examination:** Pay attention to neurologic examination and the child’s psychosocial and language development.

### Recommendations for Children With Confirmed (Venous) Elevated Lead Concentrations
(Source: AAP, 2005)

- **5-14 μg/dL:** Dietary and environmental lead education; follow-up blood lead monitoring as per State Guidelines

- **15-19 μg/dL:** Dietary and environmental lead education; follow-up blood lead monitoring; environmental investigation, proceed to actions for 20-44 μg/dL if a follow-up blood lead concentration is in this range at least 3 months after initial venous test OR blood lead concentration increases

- **20-44 μg/dL:** Dietary and environmental lead education; follow-up blood lead monitoring; complete history and physical examination; lab work including hemoglobin or hematocrit and iron status; environmental investigation; lead hazard reduction; neurodevelopmental monitoring; abdominal radiography (if particulate lead ingestion is suspected) with bowel decontamination if indicated

- **45-69 μg/dL:** Dietary and environmental lead education; follow-up blood lead monitoring; complete history and physical examination; lab work including hemoglobin or hematocrit, iron status and free EP or ZPP; environmental investigation; lead hazard reduction; neurodevelopmental monitoring; abdominal radiography with bowel decontamination if indicated; chelation therapy.

- **≥ 70 μg/dL:** Hospitalize and commence chelation therapy; proceed according to actions for 45-69 μg/dL.

### Not Recommended at Any Blood Lead Concentration
(Source: AAP, 2005)

- Searching for gingival lead lines
- Testing of hair, teeth, or fingernails for lead
- Evaluation of renal function (except during chelation w/EDTA)
- Radiographic imaging or x-ray fluorescence of long bones

### Sources of Lead Exposure and Prevention Strategies
(Source: AAP, 2005)

<table>
<thead>
<tr>
<th>Environmental Source of Lead</th>
<th>Prevention Strategy</th>
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<tbody>
<tr>
<td>Paint</td>
<td>Identify and abate</td>
</tr>
<tr>
<td>Dust</td>
<td>Wet mop (assuming abatement)</td>
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<tr>
<td>Soil</td>
<td>Restrict play in area, plant ground cover, wash hands frequently</td>
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<tr>
<td>Drinking Water</td>
<td>Flush cold-water pipes by running water until it becomes as cold as it will get (a few seconds to 2 minutes or more; use cold water for cooking and drinking)</td>
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- Folk Remedies
- Cosmetics (e.g. with kohl or surma)
- Old Ceramic or Pewter Cookware, Urns, Kettles
- Some Imported Cosmetics, Toys, Crayons
- Contaminated Mineral Supplements

- Avoid use

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Clinical Practice Guideline

Parental Occupations
Hobbies
Home Renovation
Buying or Renting a New Home
Lead Dust in Carpet

**Host Source of Lead**
- Hand-to-mouth activity (or pica)
- Inadequate nutrition
- Developmental disabilities

**Prevention Strategy**
- Remove work clothing at work; wash work clothes separately
- Proper use, storage, and ventilation
- Proper containment and ventilation
- Inquire about lead hazards
- Cover or discard
- Frequent hand washing; minimize food on floor
- Adequate intake of calcium, iron, vitamin C
- Enrichment programs

**REFERENCES**


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**MEDICAL POLICY COMMITTEE HISTORY AND REVISIONS**

<table>
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<tr>
<th>Date</th>
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<tr>
<td>6/17/2014</td>
<td>Approved by MPC.</td>
</tr>
<tr>
<td>4/5/2012</td>
<td>Approved by MPC. Added CDC, USPSTF and NCQA references and recommendations. Deleted Georgia reference (no information contained within guideline).</td>
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<tr>
<td>12/1/2011</td>
<td>New template design approved by MPC.</td>
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<tr>
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