Lead Screening Guideline

These clinical guidelines are designed to assist clinicians by providing an analytical framework for the evaluation and treatment of patients. They are not intended to replace a clinician’s judgment or to establish a protocol for all patients with a particular condition. A guideline will rarely establish the only approach to a problem.

GUIDELINE HISTORY and APPROVAL

<table>
<thead>
<tr>
<th>ACTION</th>
<th>SEED GUIDELINE and/or MAIN INFORMATION &amp; GROUP SOURCE(S)</th>
<th>DATE</th>
<th>ORGANIZATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guideline Reviewed and Approved</td>
<td>As Above</td>
<td>10/14</td>
<td>Geisinger Health plan Quality Improvement Committee</td>
</tr>
</tbody>
</table>

Vice President, Chief Medical Officer
Geisinger Health Plan
OVERVIEW

There are approximately 250,000 children across the country whose blood lead levels are 10 μg/dL or higher and an additional 200,000 children have blood lead levels between 5 μg/dL and 10 μg/dL. On average, children whose blood lead levels rise from 10 to 20 μg/dL lose two to three IQ points. Recent studies have demonstrated proportionately greater harm from low level lead exposure than from higher levels of lead. “Lead damage is permanent and irreversible,” said Dr. Block. “Children with elevated lead levels are more likely to have behavior problems, attention deficit and reading disabilities, and fail to graduate from high school, in addition to experiencing a host of other impairments to their developing cardiovascular, immune and endocrine systems.” Few options exist for treating high levels of lead exposure, as the treatments themselves have potentially dangerous side effects and may only prevent lead poisoning fatalities. No options exist for treating the cognitive and behavioral impacts of lead exposure or for treating lead exposure at low to moderate levels. The CDC’s Advisory Committee on Childhood Lead Poisoning Prevention recommended the agency focus its resources on primary prevention of lead exposure, which AAP supports.

RECOMMENDATIONS

The Advisory Committee on Childhood Lead Poisoning Prevention (ACCLPP) recommends the following:

1. **All children enrolled in Medicaid should be screened with a blood lead test at ages 12 and 24 months or at ages 36--72 months if they have not previously been screened.**
   - If children are exposed to lead, their blood lead levels tend to increase during ages 0--2 years and peak at ages 18--24 months. Therefore, screening is recommended at both ages 1 and 2 years to identify children who need medical management and environmental and public health case management.

2. **Children identified with elevated blood lead levels require evaluation and referral for appropriate follow-up services.**
   - Children identified with elevated blood lead levels should be evaluated and treated in accordance with CDC guidelines for follow-up care, including care coordination and public health, medical, and environmental management. Many children with elevated BLLs will need follow-up services, including more frequent blood lead testing, environmental investigation, case management, and lead hazard control.
CLINICAL EVALUATION

Environmental History

**Exposure**: Items to consider:
- age and condition of primary residence,
- evidence of chewed or peeling paint,
- length of time family been at current residence,
- Does the child live in or regularly visit a house that was built before 1950 (day care center, or the home of a babysitter or relative)
- Does the child live in or regularly visit a house built before 1978 with recent or ongoing renovations or remodeling (i.e., within the past six months)
- Homes containing vinyl mini-blinds made overseas and purchased before 1997
- 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

**Nutritional History**: dietary history, including:  
- Use of imported food in soldered cans, cosmetics, or folk remedies;  
- food prepared or stored in imported pottery or metal vessels;  
- candies imported from Mexico

**Physical Examination**:  
- neurologic examination  
- psychosocial and language development  
- Hand to mouth activity by the child

**TREATMENT**

Chelation therapy is recommended by the CDC for blood lead levels of 45 μg per dL (2.17 μmol per L) or greater. The CDC recommends consulting an expert such as a toxicologist before starting chelation therapy.

A complete blood count; reticulocyte count; urinalysis; and testing of electrolytes, blood urea nitrogen, creatinine, and liver function should be performed and any iron deficiency should be identified.

Abdominal radiography can identify any materials containing lead that remain in the gut.
Children with levels higher than 70 μg per dL (3.38 μmol per L) should be hospitalized immediately for treatment under direct medical supervision.

An environmental investigation to identify and remediate the source of the lead should be performed in collaboration with the local health department. Remediation measures include removing the child from the source of lead, correcting the source of lead by home renovation or cleaning, and avoiding any sources of lead such as contaminated soil or products.

**PREVENTION**

**PRIMARY PREVENTION**
Primary prevention of lead poisoning in children includes strategies such as eliminating lead in gasoline and paint, which have had a positive effect in lowering blood lead levels in U.S. children.

**SECONDARY PREVENTION**
Because lead is ubiquitous in the environment, secondary prevention focuses on identifying asymptomatic children with high levels of lead in their blood. For children with elevated levels, once the source is identified, the lead hazard should be evaluated, treated, and monitored by a safe-lead authority (available services can be identified by the local health department). Follow-up is important to prevent the cycle of inadequately treated housing exposing additional children who subsequently live in the residence.

Other measures of prevention that have been studied include:
- parental education,
- dust control,
- soil abatement.

However, these interventions have not been validated to show that any of them lead to clinical, behavioral or cognitive improvement. Dust control, if done by cleaning professionals, may have the beneficial effect of lowering both environmental and blood lead levels.

**PREVENTION STRATEGIES**

<table>
<thead>
<tr>
<th>Paint</th>
<th>Identify and abate</th>
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<tbody>
<tr>
<td>Dust</td>
<td>Wet mop (assuming abatement)</td>
</tr>
<tr>
<td>Soil</td>
<td>Restrict play in area, plant ground cover, wash hands frequently</td>
</tr>
<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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<tr>
<td>Folk Remedies</td>
<td>Avoid use</td>
</tr>
<tr>
<td>Cosmetics (e.g. with kohl or surma)</td>
<td>Avoid use</td>
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<td>--------------------------</td>
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<tr>
<td>Old Ceramic or Pewter</td>
<td>Avoid use</td>
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<tr>
<td>Cookware</td>
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<tr>
<td>Imported Cosmetics,</td>
<td>Avoid use</td>
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<tr>
<td>Toys, Crayons</td>
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<tr>
<td>Contaminated Mineral</td>
<td>Avoid use</td>
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<tr>
<td>Supplements</td>
<td></td>
</tr>
<tr>
<td>Parental Occupations</td>
<td>Remove work clothing at work; wash work</td>
</tr>
<tr>
<td></td>
<td>clothes separately</td>
</tr>
<tr>
<td>Hobbies</td>
<td>Proper use, storage, and ventilation</td>
</tr>
<tr>
<td>Home Renovation</td>
<td>Proper containment and ventilation</td>
</tr>
<tr>
<td>Buying or Renting a</td>
<td>Inquire about lead hazards</td>
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<tr>
<td>New Home</td>
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</table>

**BIBLIOGRAPHY**


**MEASURES**

- Percentage of children 2 years of age who received one or more capillary or venous blood tests for lead poisoning on or before their second birthday