Health Effects of Childhood Lead Exposure

- Even low levels of lead in the blood have been shown to cause learning difficulties, behavior problems, and other cognitive effects.\(^1\)
- Studies have also suggested that low levels of lead in the blood can also result in cardiovascular\(^2\), immunological\(^3\), and endocrine effects\(^4\).
- The adverse health effects of lead exposure can be permanent.

Blood Lead Reference Value

- Beginning in 2012, CDC began using a population-based blood lead reference value (BLRV) to identify children with higher levels in their blood compared to most children.
  - This reference level is based on the 97.5th percentile of the blood lead values among U.S. children ages 1–5 years, according to data from the National Health and Nutrition Examination Survey (NHANES).
  - In 2012, the BLRV was established to be 5 micrograms per deciliter (µg/dL) based on NHANES data from 2007–2010. In 2021, the BLRV was updated to 3.5 µg/dL based on NHANES data from 2015–2018.
  - The BLRV is a population-based screening tool and should not serve as a health-based threshold. Children with BLLs at or above the BLRV represent those at the top 2.5% with the highest BLLs.

Previous Definitions for Interpreting Childhood Blood Lead Levels

<table>
<thead>
<tr>
<th>Year</th>
<th>Blood lead level (µg/dL)</th>
<th>Interpretation*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>60</td>
<td>Not applicable</td>
</tr>
<tr>
<td>1970</td>
<td>40</td>
<td>Undue or increased lead absorption</td>
</tr>
<tr>
<td>1975</td>
<td>30</td>
<td>Undue or increased lead absorption</td>
</tr>
<tr>
<td>1978</td>
<td>30</td>
<td>Elevated blood lead level</td>
</tr>
<tr>
<td>1985</td>
<td>25</td>
<td>Elevated blood lead level</td>
</tr>
<tr>
<td>1991</td>
<td>10</td>
<td>Level of concern</td>
</tr>
<tr>
<td>2012</td>
<td>5</td>
<td>Reference value</td>
</tr>
<tr>
<td>2021</td>
<td>3.5</td>
<td>Reference value</td>
</tr>
</tbody>
</table>

*https://stacks.cdc.gov/view/cdc/61820
Interpreting Children’s Blood Lead Levels

As no safe level of lead in children’s blood has been identified, a BLL threshold should not be used to determine follow-up and case management actions. CDC recommends that healthcare providers, public health professionals, and others initiate follow-up actions based on CDC’s Recommended Actions Based on Blood Lead Level.

Steps can be taken to prevent further exposure and mitigate the harmful effects of lead exposure for children with any amount of lead in their blood. See CDC’s Lead Poisoning Prevention web page for more information.

Several factors can affect how a child’s body handles exposure to lead. These include the

- Child’s age
- Nutritional status
- Source of lead exposure
- Length of time the child was exposed
- Presence of other underlying health conditions

Alternative terms for discussing children’s blood lead levels

- “blood lead levels greater than ____ µg/dL”
- “blood lead levels greater than most children”
- “blood lead levels above CDC’s BLRV”
- “blood lead levels above the state’s level that triggers follow-up care”

Note: As of July 2022, the Council of State and Territorial Epidemiologists (CSTE) updated their position statement for lead. This position statement updates 15-EH-01 by changing the name of the condition under surveillance from “elevated blood lead level” to “lead in blood” and updating the criteria for reporting, the case definition, and case classifications.

References


Learn more at www.cdc.gov/nceh/lead