

## Lead Exposure in Children

### Key Messages

- Be aware that while most children show no clinical symptoms, lead exposure can result in learning and behavior problems. Exposures at higher levels can present with anemia, abdominal pain, vomiting, seizures, symptoms of encephalopathy, hypertension, or kidney problems and can lead to organ damage and death.
- Educate parents and assess children up to age 6 years annually AND test those at risk, including all children at ages 1 and 2 years, as mandated (10 NYCRR §67-1.2). Consider testing older children with a history of elevated blood lead levels (BLLs), residency outside of the United States, eating nonfood items, sickle cell disease, or developmental delays.
- Use the Online Registry to view children's BLLs, find management recommendations, and access New York City (NYC) Health Department home inspection results. To report a hospital admission or discuss a case, call 646-632-6002.

### Recommended Lead Risk Assessment Questions

*Use to assess lead exposure. If the answer to any question is yes, draw blood for a lead test.*

- Is your child between 9 and 36 months old?  
*Children at this age typically have hand-to-mouth behavior, placing them at risk of exposure.*
- Have any of your children or their playmates ever had a high BLL?
- Does your child spend time in an older home or other place with peeling or damaged paint somewhere that has recently undergone renovation?  
*Although lead-based paint for residential use in NYC was banned in 1960, about 67% of NYC housing was built before 1960.*
- Does your child have any developmental delays, have hand-to-mouth behavior, or put nonfood items, such as paint chips or soil, in their mouth?  
*Children with autism often have hand-to-mouth activity that puts them at greater risk for lead poisoning.*
- Has your child moved to the United States from, or traveled to, a country where lead poisoning is common?<sup>a</sup>  
*Children born outside of the United States, particularly children who are refugees or internationally adopted, should have their BLL tested when they arrive in the United States and again 3 to 6 months after they have settled in permanent housing.*
- Does your family use products from other countries, such as health remedies, spices, food, or pottery?
- Does your child play near a highway, bridge, or elevated train where there is peeling paint?
- Does your child come into contact with someone whose job or hobby involves exposure to lead (such as bridge repainting or repair, construction or demolition, home painting or renovation, automotive or electronics repair, furniture refinishing, or working with firearms, jewelry, pottery, stained glass, metals, or color pigments)?
- Are you planning to enroll your child in Medicaid or the NYC Early Intervention Program?<sup>b</sup>

<sup>a</sup>Among NYC children whose families were interviewed between 2016 and 2020, elevated BLLs have been found in at least 2 children emigrating from, in descending order of frequency, Bangladesh, Pakistan, Haiti, Georgia, Guatemala, India, Ecuador, Honduras, Dominican Republic, Afghanistan, Mexico, Guinea, Egypt, Yemen, Nigeria, Uzbekistan, Guyana, Côte d'Ivoire, Nepal, China, Ghana, Gambia, Jamaica, Burkina Faso, Senegal, Togo, Algeria, Liberia, El Salvador, Mali, Morocco, Russian Federation, Tajikistan, United Arab Emirates, Republic of the Congo, Germany, Greece, Peru, Saudi Arabia, Trinidad and Tobago, Albania, Armenia, Benin, Belarus, Bhutan, Democratic Republic of the Congo (Zaire), United Kingdom, Guinea-Bissau, Israel, Niger, Sudan, Syrian Arab Republic, and Venezuela.

<sup>b</sup>Medicaid requires a blood lead test for children up to age 6 years who have not been previously tested. Enrollment in preschool/day care and the Early Intervention Program both require BLL documentation.

### Recommended Educational Messages

- Keep your child away from peeling paint and home repairs that disturb paint.
- Report peeling paint to your landlord. Call 311 if repairs are not made or to report repair work creating dust.
- Frequently wash hands, toys, pacifiers, bottles, and other items your child puts in their mouth.
- Clean floors, windowsills, and dusty places often with wet mops and wet cloths.
- Avoid using health remedies from other countries. Keep cosmetics and religious/cultural powders such as kohl, kajal, surma, and sindoor away from children. Some of these products may contain high levels of lead. See [nyc.gov/hazardousproducts](http://nyc.gov/hazardousproducts).
- Avoid using imported clay pots and dishes to cook, serve, or store food, and do not use pottery that is chipped or cracked.
- Avoid eating candies, spices, and foods purchased in other countries. Keep jewelry, amulets, and painted maracas away from children. These items may contain lead.
- Run your tap for at least 30 seconds, until the water is noticeably colder, before using it for drinking, cooking, or making baby formula any time a faucet has not been used for several hours.
- If any household members have jobs or hobbies that expose them to lead, keep your child away from their work clothes and tools. Wash work clothes separately from other laundry and remove shoes and work clothes before entering the house.

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### Recommended Management of Children

BLL (µg/dL)	Recommendations
3.5 to <20	<ul style="list-style-type: none"> <li>Assess potential sources of exposure by asking the <b>Recommended Lead Risk Assessment Questions</b> (see reverse).</li> <li>Provide <b>Recommended Educational Messages</b> (see reverse).</li> <li>Evaluate for adequate intake of calcium and iron. Adequate stores may decrease gastrointestinal absorption of lead.</li> <li>If a fingerstick specimen, confirm with venous specimen within time frame specified in <b>Recommended Follow-up Blood Lead Test Schedule</b> below. Venous specimens are more accurate than fingerstick specimens.</li> <li>Report BLLs not displayed on the Online Registry to the NYC Health Department via the Online Registry (<a href="http://nyc.gov/health/cir">nyc.gov/health/cir</a>). If unable to submit electronically, you may fax the reports to 347-396-8935.</li> <li>If analyzing specimens in your office using a point-of-care device (LeadCare®), report BLLs within 5 days.</li> <li>Monitor BLL as per <b>Recommended Follow-up Blood Lead Test Schedule for Children</b> below.</li> <li>Monitor development even after BLLs decrease. Consider this child at risk for developmental and behavioral problems.</li> <li>Consider referring patients persistently eating nonfood items for behavior modification therapy.</li> <li>The NYC Health Department may:                             <ul style="list-style-type: none"> <li>Provide information on lead sources and strategies to reduce exposure to the family and health care provider.</li> <li>Inspect homes to assess potential lead sources and order landlords to repair any identified lead paint hazards.</li> <li>Refer children aged &lt;35 months to Early Intervention for developmental monitoring.</li> </ul> </li> <li>To access inspection results, visit the <i>risk assessment and home inspection results</i> link on the "Immunization and Lead History" page of the Online Registry (<a href="http://nyc.gov/health/cir">nyc.gov/health/cir</a>).</li> </ul>
20 to <45	<p><b>All actions for BLLs 3.5 to &lt;20 µg/dL, and</b></p> <ul style="list-style-type: none"> <li>Evaluate for iron-deficiency anemia, often associated with lead poisoning.</li> <li>Consider abdominal x-ray if paint chips or other solid lead ingestion is suspected; if radio-opaque particles are found or recent ingestion is witnessed, use a cathartic.</li> </ul>
≥45	<p><b>All actions for BLLs 3.5 to &lt;45 µg/dL, and</b></p> <ul style="list-style-type: none"> <li>Arrange hospitalization and chelation according to the "Recommended Chelation Protocol for Children with BLLs ≥45 µg/dL," at <a href="https://www1.nyc.gov/assets/doh/downloads/pdf/lead/lead-chelation.pdf">https://www1.nyc.gov/assets/doh/downloads/pdf/lead/lead-chelation.pdf</a>.</li> <li>Perform a complete neurologic exam.</li> <li>Confirm BLL with venous specimen processed as an emergency test before providing chelation, unless symptoms of encephalopathy are present.</li> <li>Obtain abdominal x-ray to look for paint chips/other solid lead ingestion; if radio-opaque particles are found or recent ingestion is witnessed, use a cathartic.</li> <li>Monitor erythrocyte protoporphyrin (EP) levels to help assess timing of exposure.</li> <li>Child must receive chelation therapy in, and be discharged to, a lead-safe environment. Do not discharge the child until the NYC Health Department inspects the home.</li> <li>Inform the NYC Health Department of hospital admission by calling 646-632-6002.</li> <li>The NYC Health Department can provide:                             <ul style="list-style-type: none"> <li>Referrals to providers with expertise in treating lead poisoning. For consultations on evenings and weekends, call the Poison Control Center at 212-POISONS (764-7667).</li> <li>Referrals to temporary lead-safe housing.</li> </ul> </li> </ul>

### Recommended Follow-up Blood Lead Test Schedule for Children

Fingerstick BLLs ≥3.5 µg/DL		Venous BLLs ≥3.5 µg/DL		
Capillary Test Result (µg/dL)	Confirmatory Venous Test	Venous BLL (µg/dL)	Early Follow-up Test (first 2 to 4 tests after identification)	Late Follow-up Test (after BLL begins to decline)
3.5 to <10	Within 3 months <sup>a</sup>	3.5 to <10	1 to 3 months <sup>a</sup>	6 to 9 months
10 to <20	Within 1 month	10 to <20	1 to 3 months <sup>a</sup>	3 to 6 months
20 to <45	Within 2 weeks	20 to <45	2 weeks to 1 month	1 to 3 months
≥45	Immediately	≥45	As soon as possible	Chelation with follow-up

<sup>a</sup>Health care providers may choose to repeat BLLs within 1 month for patients newly identified with an elevated BLL to confirm that BLL is not rising rapidly