



# City Health Information

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The New York City Department of Health and Mental Hygiene

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## CHILDHOOD LEAD POISONING PREVENTION AND MANAGEMENT

### HEALTH CARE PROVIDERS SHOULD:

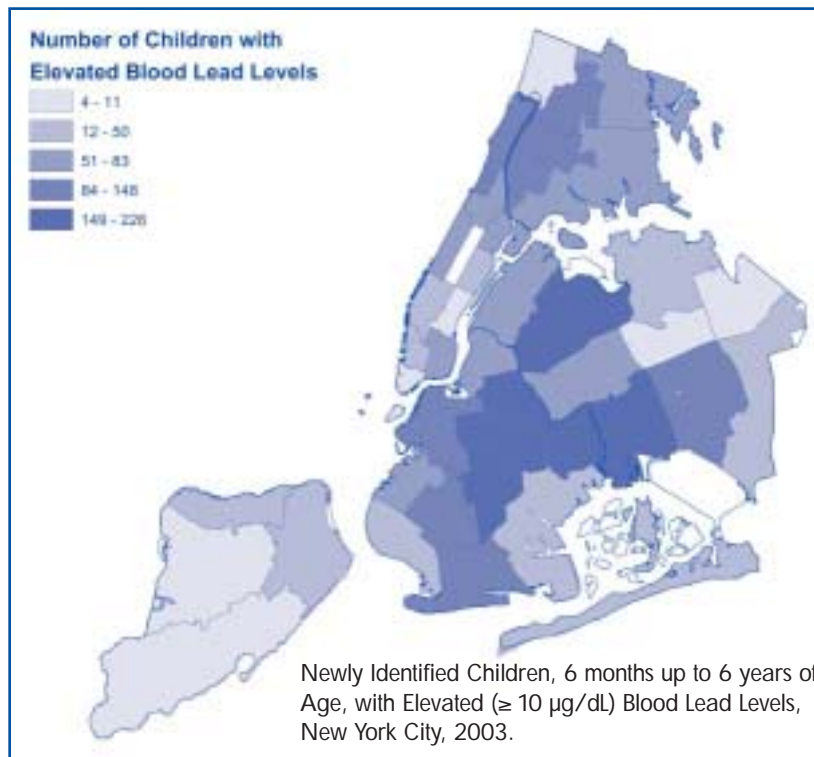
- Tell families to call 311 if they reside in a pre-1960 building and their landlord doesn't fix peeling paint as required by NYC law.
- Screen all children for lead poisoning at ages 1 and 2 years as required by NYS law.
- Inform families with children younger than 6 years about lead poisoning prevention. Assess the child's risk of lead poisoning and test if the risk is high.

Childhood lead poisoning remains a serious problem in New York City (NYC). In 2003, 3,413 NYC children (6 months up to 6 years) were newly identified with blood lead levels (BLLs) of 10 micrograms per deciliter or higher ( $\geq 10 \mu\text{g}/\text{dL}$ ), the Centers For Disease Control and Prevention (CDC) definition of an elevated BLL. Children of color and those living in low-income neighborhoods with deteriorated housing are disproportionately affected. In 2003, 88% of NYC children with BLLs that triggered an environmental inspection by the Lead Poisoning Prevention Program (LPPP) of the NYC Department of Health and Mental Hygiene (NYC DOHMH), were African-American, Asian, or Hispanic. More than half the

cases were concentrated in just 9 neighborhoods.

However, lead poisoning is preventable. The number and severity of cases have dramatically declined over the past 3 decades. In 2000, 2.2% of US children (age 1 up to 6 years old) had BLLs  $\geq 10 \mu\text{g}/\text{dL}$ , in contrast with 88.2% in 1976.<sup>1</sup> The mean BLL of US

urban children in 1976 (age 6 months up to 6 years) was  $18 \mu\text{g}/\text{dL}$ .<sup>2</sup> In NYC, the number of children with elevated BLLs (age 6 months up to 6 years) decreased by 82% between 1995 and 2003. The decline can be largely attributed to regulations restricting or banning the use of lead in gasoline, paint, solder, and other consumer products, as well as NYC regulations requiring the repair of lead paint hazards.



## The Importance of Prevention

Elevated BLLs are associated with adverse health outcomes that include cognitive and other developmental delays. Even BLLs less than 10 µg/dL have been associated with negative health effects.<sup>3,4</sup> Exposure to lead early in life can have long-lasting health effects, even if exposure is eliminated and BLLs decrease. It is critical to test all children at ages 1 and 2 for elevated BLLs, and to advise all parents to report damaged or peeling paint by calling 311.

## Risk Assessment and Risk Reduction Education are Critical to Prevention

NY State requires that health care providers annually assess all children age 6 months up to 6 years for risk of lead exposure and provide their families with education about lead poisoning prevention.<sup>5</sup> Providers can use a risk assessment tool (see questionnaire) to help families identify potential lead sources in their environment.

## Early Detection and Prevention Through Blood Lead Testing

Most children with elevated BLLs have no clinical symptoms—blood lead testing is the most practical way to determine if a child has lead poisoning. Identifying poisoned children is essential so that lead sources in their environment can be identified and removed as quickly as possible.

Universal testing of children age 1 and 2 years is mandated by law. It is important because normal hand-to-mouth toddler behavior greatly increases the risk of ingesting lead.

Providers should recognize that even a BLL of 5 to 9 µg/dL may indicate lead exposure. Follow-up should include educating the family about ways to minimize exposure to potential lead sources.

### Please be sure that lab requisition forms include:

- Name of child, date of birth, complete address, county of residence, sex, and ethnic/racial background
- Name of physician
- Type of sample (venous or finger stick) and dates of collection

The NYC DOHMH Lead Poisoning Prevention Program (LPPP) uses this information to follow lead-poisoned children, support intervention efforts, and target services to high-risk populations.

## Intervention Services for Lead-Poisoned Children

For children with BLLs of 10 to 14 µg/dL, the LPPP sends information to the family and the health care provider on lead poisoning prevention and the importance of follow-up blood lead testing.

For a venous BLL  $\geq$  15 µg/dL, the LPPP:

- Contacts the child's family and health care provider to describe LPPP services and to emphasize the importance of follow-up testing and intervention to limit lead exposure.
- Inspects the child's home to identify potential sources of exposure.
- Educates the family about practical ways to protect the child from lead.
- Orders the building owner to repair or remove any lead paint hazards identified.
- Monitors repair work to ensure that it is done safely.
- Refers families who cannot find housing during corrective work to temporary, lead-free housing.
- Offers health care providers medical consultations regarding management of individual cases.

## CDC Recommendations on Developmental Monitoring and Nutrition

The CDC Advisory Committee on Childhood Lead Poisoning recommends that physicians provide ongoing developmental monitoring for children with BLLs  $\geq$  10 µg/dL through the early teen years; problems may emerge as late as the seventh grade.<sup>3</sup> Physicians should refer children less than 3 years of age with elevated BLLs for a thorough developmental evaluation. Call 311 and request an evaluation through the NYC DOHMH Early Intervention Program.

Health care providers should advise families to provide a well-balanced and age-appropriate diet that includes adequate calcium, iron, and vitamin C. Good nutrition is not a substitute, however, for helping families identify and remove lead sources.

# INFORMATION FOR FAMILIES ON LEAD POISONING

**Peeling and chipping lead paint and household dust containing lead are the main sources of children's exposure to lead in NYC.**

## Protect Children From Lead

- Report any peeling paint to your landlord. Landlords are required by law to fix peeling and chipping paint if a child lives in a building with 3 or more units built before 1960.
- **Call 311 for assistance if the landlord does not fix damaged paint.**
- Clean floors and windowsills frequently using a wet mop or wet cloth. Lead dust is often found in these places.
- Wash children's hands, toys, pacifiers, and bottles frequently to remove lead dust.
- Take precautions to avoid exposure to lead dust when doing home repair and renovation work or when preparing walls for repainting. Call 311 for information on safe work methods.
- Avoid using folk remedies or imported cosmetics, spices, and foods unless you are sure they do not contain lead (see box, right).
- Avoid using imported pottery to cook, serve, or store food.
- Take special precautions if your job or hobby involves exposure to lead. Don't bring work clothes or shoes into your house. Jobs and hobbies of concern include construction, bridge maintenance, home renovation and repair, furniture refinishing, automotive and electronics repair, making stained glass or pottery, and target practice at a firing range.

## Sources of Lead Exposure

- Peeling and chipping lead paint and household dust containing lead
- Lead-glazed pottery
- Imported food and spices
- Folk remedies and cosmetics
- Emigration from, or travel to, countries with significant lead contamination
- Lead brought into homes from jobs or hobbies
- Soil in outdoor play areas contaminated by auto exhaust or peeling paint
- Drinking water supplied through lead mains or plumbing that contains lead solder
- Prenatal exposures from current maternal exposure or from pregnancy-associated mobilization of bone stores

## IMPORTED PRODUCTS THAT MAY CONTAIN LEAD

**Middle East:** Kohl, Al Kohl, Al Murrah, Anzroot, Bint Al Dehab, Kandu, Cebagin, Farouk, Santrinj

**India/Pakistan/Bangladesh:** Surma (aka Kohl or Al Kohl), Sindoor, Bali Goli, Bint Al Dehab, Deshi Dewa, Ghasard

**China:** Ba Bow Sen, Jin Bu Huan, Poying Tan, Cordyceps

**Mexico:** Greta, Azarcon (aka Alarcon, Luiga, Maria Luisa, Coral, or Rueda), Albayalde. Also candy and snacks, including Chapulines and Chaca Chaca, and glazed pottery.

**Dominican Republic:** Litargirio

# LEAD POISONING PREVENTION, SCREENING, AND MANAGEMENT GUIDE

## NYC DEPARTMENT OF HEALTH AND MENTAL HYGIENE, LEAD POISONING PREVENTION PROGRAM (LPPP), SEPTEMBER 2004.

### CHECKLIST OF HEALTH CARE PROVIDER RESPONSIBILITIES

- TEST EVERY CHILD FOR LEAD POISONING AT AGE 1 AND 2 YEARS.<sup>5</sup>
- Annually assess every child from 6 months up to 6 years of age for risk of lead exposure using a risk assessment tool and provide the family with education on lead poisoning prevention.<sup>5</sup>
- Test every child found to be at risk.<sup>5</sup>
- Report blood lead test results  $\geq 10$   $\mu\text{g}/\text{dL}$  to the NYC Department of Health and Mental Hygiene (NYC DOHMH) within 24 hours.<sup>6</sup> Fax (212) 676-6326 or call (212) 676-6158.
- Follow medical management guidelines in Table 1.

Medicaid requires that providers test children at age 1 and 2 years, and also test any child less than 6 years old who has never been tested.<sup>7</sup>

### Remind Families to Report Peeling Paint!

**Families with young children should report peeling paint to their landlords. If the landlord fails to respond, the family should call 311 for assistance. The city will send an inspector and may order the landlord to make repairs.**

**TABLE 1. MEDICAL MANAGEMENT OF CHILDREN BASED ON BLOOD LEAD LEVELS\***

Blood Lead Level $\mu\text{g}/\text{dL}$	Recommended Action*
<10	<ul style="list-style-type: none"> <li>• Provide risk reduction education to prevent exposure</li> <li>• Provide nutrition education</li> <li>• If risk assessment indicates exposure to lead is likely, consider retesting within 3 months to ensure BLL is not rising rapidly</li> </ul>
10–14	<ul style="list-style-type: none"> <li>• Report BLL to NYC DOHMH within 24 hours as required by law</li> <li>• Provide risk reduction and nutrition education</li> <li>• If initial blood test was capillary sample, confirm with venous sample within time specified in Table 2**</li> <li>• Retest BLL as per follow-up schedule in Table 3</li> </ul>
15–19	<ul style="list-style-type: none"> <li>• Follow steps for BLL of 10–14 <math>\mu\text{g}/\text{dL}</math></li> <li>• If BLL remains in 15–19 <math>\mu\text{g}/\text{dL}</math> range for 3 months, proceed with actions for BLL of 20–44 <math>\mu\text{g}/\text{dL}</math></li> <li>• Collaborate with LPPP, which will provide home inspection and other services</li> </ul>
20–44	<ul style="list-style-type: none"> <li>• Follow steps for child with BLL of 10–14 <math>\mu\text{g}/\text{dL}</math></li> <li>• Provide a complete medical evaluation including a detailed environmental history, developmental assessment, physical exam, and evaluation for iron deficiency anemia, which is often associated with lead poisoning. If particulate ingestion is suspected, obtain abdominal x-ray and order bowel decontamination if indicated.</li> <li>• Collaborate with LPPP, which will provide home inspection and other services</li> </ul>
45–69	<ul style="list-style-type: none"> <li>• Confirm BLL with venous sample (within 24–48 hours) before initiating chelation</li> <li>• Provide or refer for chelation therapy within 48 hours. Child must be in lead-safe environment during chelation</li> <li>• Follow all steps for BLL of 20–44 <math>\mu\text{g}/\text{dL}</math></li> <li>• Perform complete neurological exam and consider free erythrocyte (FEP) or zinc protoporphyrin (ZPP) testing to assist in evaluating child's response to management</li> </ul>
$\geq 70$	<ul style="list-style-type: none"> <li>• Arrange immediate hospitalization and chelation at a facility with expertise in treating lead-poisoned children. Call the LPPP Medical Director at (212) 676-6100 for referral to an appropriate facility. On evenings and weekends call 311 and ask for Poison Control.</li> <li>• Confirm BLL immediately with venous sample processed as an emergency lab test</li> <li>• Follow all steps for BLL of 20–44 <math>\mu\text{g}/\text{dL}</math></li> <li>• Perform complete neurological exam and consider FEP or ZPP testing to assist in evaluating child's response to management</li> </ul>

\*Tables 1, 2, and 3 are based on recommendations in CDC's *Managing Elevated Blood Lead Levels Among Young Children: Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention* (CDC, March 2002) which is available at [www.cdc.gov/nceh/lead/CaseManagement/CaseManage\\_main.htm](http://www.cdc.gov/nceh/lead/CaseManagement/CaseManage_main.htm).

\*\*Capillary samples are more likely to be contaminated with environmental lead.

## Risk Assessment Questionnaire

If the parent or caregiver answers affirmatively to one or more of the following questions, the child should undergo a blood lead test.

1. Does the child have a sibling, house-mate, or playmate who has been diagnosed with lead poisoning?
2. Does the child live in, or regularly visit, a home or other building built before 1960 (NYC banned the use of lead paint in residential buildings in 1960) that has peeling paint? This could include a day care center, a preschool, or the home of a baby-sitter or relative.
3. Does the child live in, or regularly visit, a home or building built before 1960 where renovation or remodeling is planned, ongoing, or recently completed?
4. Does the child live with, or frequently visit, a person whose job or hobby may involve exposure to lead? This includes construction, demolition, bridge maintenance, home renovation and repair, automotive and electronic repair, furniture refinishing, making stained glass and pottery, or target practice at a firing range.
5. Does the child play outside in dirt that could be contaminated with lead from a nearby expressway, bridge, elevated train, or a building with peeling paint on the outside?
6. Has the child traveled abroad or moved to the US from another country within the last year? Elevated BLLs have been noted in children born in countries such as Haiti, Mexico, Pakistan, the Dominican Republic, and Bangladesh.
7. Does the child's family prepare, store, or serve food in imported pottery?
8. Does the family use imported folk remedies, cosmetics, spices, or food?

**TABLE 2. CDC SCHEDULE FOR OBTAINING A CONFIRMATORY VENOUS SAMPLE<sup>3</sup>**

Capillary Test Result (µg/dL)	Time Frame for Confirmatory Venous Test
10–19	3 months*
20–44	1 week–1 month**
45–59	48 hours
60–69	24 hours
≥70	Immediately, as an emergency lab test

\*Health care providers may choose to repeat blood lead tests within 1 month for patients newly identified with an elevated BLL to ensure that the level is not rising rapidly.

\*\*The higher the BLL, the more urgent the need for confirmatory venous testing.

### NYC DEPARTMENT OF HEALTH AND MENTAL HYGIENE ONLINE REGISTRY

Health care providers can use the NYC DOHMH Online Registry to check children's previous blood lead tests and immunization records. Call (212) 676-2323 to obtain a user ID and password.

**TABLE 3. CDC-RECOMMENDED FOLLOW-UP BLOOD TEST SCHEDULE FOR CHILDREN WITH VENOUS BLLS ≥10 µg/dL<sup>3</sup>**

Venous BLL (µg/dL)	Early Follow-Up Test (first 2–4 tests after identification)*	Late Follow-up Test (after BLL begins to decline)*
10–14	3 months **	6–9 months
15–19	1–3 months**	3–6 months
20–24	1–3 months**	1–3 months
25–44	2 weeks–1 month	1 month
≥45	As soon as possible	Chelation with subsequent follow-up

\*Greater exposure to lead in the summer months may necessitate more frequent follow-up tests.

\*\*Health care providers may choose to repeat blood lead tests within 1 month for patients newly identified with an elevated BLL to ensure that the level is not rising rapidly.

## INFORMATION RESOURCES FOR HEALTH CARE PROVIDERS

- Access the Online Registry to check blood lead test results and immunization records for children. Call (212) 676-2323 to obtain a user ID and password.
- Fax (212) 676-6326 or call (212) 676-6158 to report BLLs  $\geq 10$   $\mu\text{g}/\text{dL}$ .
- Call 311 to obtain information about lead poisoning.
- Call 311 to make a referral to the NYC DOHMH Early Intervention Program.
- Obtain brochures and other information from LPPP website at [www.nyc.gov/html/doh/html/lead/lead.html](http://www.nyc.gov/html/doh/html/lead/lead.html)
- Call (212) 676-6100 to request a telephone consultation with an LPPP physician about medical management of an individual child with an elevated blood lead level.
- Consult the CDC report *Managing Elevated Blood Lead Levels Among Young Children: Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention* (CDC, March 2002) at [www.cdc.gov/nceh/lead/CaseManagement/CaseManage\\_main.htm](http://www.cdc.gov/nceh/lead/CaseManagement/CaseManage_main.htm)

## REFERENCES

1. Meyer PA, Pivetz T, Dignam TA, Homa DM, Schoonover J, Brody D, and the Centers for Disease Control and Prevention. Surveillance for elevated blood lead levels among children—United States, 1997-2001. *MMWR Surveill Summ.* 2003;52:1–21.
2. Annett JL, Mahaffey KR, Cox DH, Roberts J. Blood lead levels for persons 6 months–74 years of age: United States, 1976-80. *Adv Data.* 1982;79:1–23.
3. Centers for Disease Control and Prevention. *Managing Elevated Blood Lead Levels Among Young Children: Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention.* Atlanta Ga: Centers for Disease Control and Prevention; 2002.
4. Canfield RL, Henderson CR Jr., Cory-Slechta DA, Cox C, Jusko T, Lamphear BP. Intellectual impairment in children with blood lead concentrations below 10  $\mu\text{g}$  per deciliter. *New Engl J Med.* 2003;348:1517–1526.
5. N.Y. COMP. CODES R. & REGS. Lead screening and follow-up of children by health care providers. ch 10, §67-1.2 (1993).
6. 24 RCNY §11.03.
7. Centers for Medicare & Medicaid Services. State Medicaid Manual. Appropriate laboratory testing. §5123.2D.

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