



# THE CITY OF NEW YORK

## DEPARTMENT OF HEALTH AND MENTAL HYGIENE

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### Guidelines for Health Care Providers on the Prevention, Identification, and Medical Management of Lead Poisoning in Pregnant Women in New York City

#### Health Care Providers Should:

- Educate all pregnant women about how to prevent lead poisoning.
- Assess all pregnant women at the initial prenatal visit and test those at risk.
- Report blood lead levels  $\geq 10\mu\text{g/dL}$  to DOHMH within 24 hours.

Guidelines for managing elevated blood lead levels are inside.

Dear Colleague:

New York State law requires prenatal care providers to assess every pregnant woman for the risk of lead exposure at the initial prenatal visit and to determine the blood lead level (BLL) of those found to be at risk. In 2005 in New York City (NYC), nearly 500 women of reproductive age (16-49 years) were reported with BLLs  $\geq 10\mu\text{g/dL}$ , and 89 pregnant women were newly identified with BLLs  $\geq 15\mu\text{g/dL}$ .

Scientific evidence over the past 40 years indicates that BLLs of  $\geq 10\mu\text{g/dL}$  in children are associated with adverse cognitive and behavioral effects. Increasing evidence indicates that childhood exposure to lead adversely affects neurodevelopment at even lower blood lead levels.<sup>1,2,3</sup>

While the literature has focused primarily on childhood exposure, fetal exposure may also adversely affect neurodevelopment. Lead freely crosses the placenta, increasing the risk to the fetus of premature birth, decreased fetal growth, and reduced cognitive and behavioral function. Pregnant women exposed to high lead levels are at increased risk for miscarriage, premature labor, and pregnancy-induced hypertension. Exposure may be from exogenous sources during pregnancy or from endogenous bone stores mobilized as a result of pregnancy.

The following recommendations have been developed by the NYC Department of Health and Mental Hygiene (DOHMH) to offer health care providers guidance on the prevention, identification, and medical management of lead poisoning in pregnant women in NYC.

Sincerely,

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1. Canfield RL, Henderson CR Jr., Cory-Slechta DA, Cox C, Jusko TA, Lanphear BP. Intellectual impairment in children with blood lead concentrations below 10  $\mu\text{g}$  per deciliter. *New Engl J Med* 2003; 348:1517-1526.

2. Lanphear BP, Hornung R, Khoury J, Yolton K, Baghurst P, Bellinger DC, et al. Low level environmental lead exposure and children's intellectual function: an international pooled analysis. *Environ Health Perspect* 2005; 113:894-899.

3. Centers for Disease Control and Prevention. Preventing lead poisoning in young children. Atlanta: CDC; 2005.

# GUIDELINES FOR HEALTH CARE PROVIDERS ON PREVENTION AND IDENTIFICATION

## 1. Educate all pregnant women about how to prevent lead poisoning during pregnancy.

As required by New York State law (10 NYCRR Subpart §67-1.5), provide anticipatory guidance on lead poisoning prevention to every pregnant woman, regardless of the results of the risk assessment.

### Anticipatory Guidance and Risk Reduction Education For Pregnant Women

- Avoid using health remedies, spices, foods, or cosmetics from other countries.
- Avoid using clay pots and dishes from other countries to cook, serve, or store food and do not use pottery that is chipped or cracked.
- Never eat non-food items such as clay, soil, pottery, or paint chips.
- Stay away from any repair work being done in the home.
- Avoid jobs or hobbies that may involve contact with lead, such as home renovation or working with glass, ceramics, or jewelry.

## 2. Assess all pregnant women for lead exposure at the initial prenatal visit and test those at risk, as required by New York State law (10 NYCRR subpart §67-1.5).

Ask the following questions to assess the risk of lead exposure. If the pregnant woman answers “yes” to any of these questions, she should have a blood lead test. Some prenatal practices predominantly serve pregnant women at risk for lead exposure. These practices may elect to routinely test all pregnant women at their first prenatal visit.

### Recommended Lead Risk Assessment Questions for Pregnant Women

- Were you born, or have you spent any time, outside of the United States?

*In NYC, approximately 95% of identified lead-poisoned pregnant women are foreign-born. Countries of birth in descending order of frequency include Mexico, India, Bangladesh, Russia, Pakistan, Ecuador, Haiti, Jamaica, Morocco, Dominican Republic, Guatemala, Guyana, El Salvador, Gambia, Ghana, Honduras, Israel, Ivory Coast, Korea, Nepal, Sierra Leone, and Trinidad.*

- During the past 12 months, did you use any imported health remedies, spices, foods, ceramics, or cosmetics?
- At any time during your pregnancy, did you eat, chew on, or mouth non-food items such as clay, crushed pottery, soil, or paint chips?
- In the last 12 months, has there been any renovation or repair work in your home or apartment building?
- Have you ever had a job or hobby that involved possible lead exposure, such as home renovation or working with glass, ceramics, or jewelry?

## 3. Report blood lead levels $\geq 10$ $\mu\text{g}/\text{dL}$ to DOHMH within 24 hours.

The NYC Department of Health and Mental Hygiene (DOHMH) *must* be notified of all blood lead test results  $\geq 10$   $\mu\text{g}/\text{dL}$  within 24 hours by both health care providers and laboratories, as required by NYC Health Code (24 RCNY §11.03, 11.05 and 11.06), so that services can be provided promptly. Fax reports of elevated BLL results to (212) 676-6188 and call (212) 676-6379.

# GUIDELINES FOR HEALTH CARE PROVIDERS ON MEDICAL MANAGEMENT OF PREGNANT WOMEN WITH BLOOD LEAD LEVELS $\geq 5\mu\text{g/dL}$

1. Provide additional intrapartum care — develop a management plan based on BLLs and follow-up appropriately.

Recommended Medical Management of Pregnant Women Based on Blood Lead Levels			
BLL ( $\mu\text{g/dL}$ )	Interventions	Time Frame for Interventions	Frequency of BLL Follow-up Testing
5 – 9	<ul style="list-style-type: none"> <li>Assess for risk factors in greater detail.</li> <li>Provide risk reduction education.</li> <li>Evaluate for adequate intake of calcium, iron, and vitamin C.*</li> <li>Monitor BLL.</li> </ul>	Within 30 days	<ul style="list-style-type: none"> <li>Repeat after interval of at least 1 month to assess trend.</li> <li>Repeat each trimester.</li> </ul>
10 – 14	<p><b>Above actions, plus:</b></p> <ul style="list-style-type: none"> <li><b>Notify DOHMH within 24 hours.</b></li> <li>DOHMH will mail educational materials to the pregnant woman and her health care provider.</li> <li>Refer to an occupational health clinic if potential occupational exposure is found.</li> </ul>	Within 30 days	<ul style="list-style-type: none"> <li>Repeat after interval of at least 1 month to assess trend.</li> <li>Repeat each trimester.</li> </ul>
15 – 44	<p><b>Above actions, plus:</b></p> <ul style="list-style-type: none"> <li>Evaluate for other symptoms.<sup>†</sup></li> <li>DOHMH will:               <ul style="list-style-type: none"> <li>Conduct home visits to identify potential exposure sources.</li> <li>Recommend strategies to reduce exposure.</li> <li>Coordinate care with health care providers.</li> </ul> </li> <li>Consider monitoring free erythrocyte protoporphyrin levels (FEP) when BLL <math>\geq 25\mu\text{g/dL}</math> to help assess timing of exposure.<sup>‡</sup></li> </ul>	Within 2 weeks	Within 2 weeks and then monthly to assess efficacy of case management
$\geq 45$	<p><b>Above actions, plus:</b></p> <ul style="list-style-type: none"> <li>Confirm BLL with venous sample.</li> <li>Consult with DOHMH &amp; lead poisoning specialist to consider hospitalization and chelation with <math>\text{CaNa}_2\text{EDTA}</math> if pregnancy is in late 2nd or 3rd trimester.</li> <li>Monitor free erythrocyte protoporphyrin levels (FEP) to help assess timing of exposure.<sup>‡</sup></li> </ul>	Within 24 hours	Within 24 hours and then at frequent intervals depending on clinical management and BLL trend
<p>*Adequate stores of calcium and iron may decrease gastrointestinal absorption of lead. Adequate stores of calcium may decrease mobilization of lead from maternal bone. Vitamin C may increase renal lead excretion.</p>			
<p><sup>†</sup> The majority of adults have no symptoms of lead poisoning. Symptoms including headaches, crampy abdominal pain, anorexia, constipation, fatigue, malaise, myalgias, and arthralgias typically occur at BLLs <math>\geq 60\text{ mg/dL}</math>, but can occur at BLLs <math>\geq 25\text{ mg/dL}</math>.</p>			
<p><sup>‡</sup> The BLL reflects more recent exposure to lead, while the FEP level reflects more chronic exposure. Once elevated, the FEP remains elevated for several months even after exposure has ceased and the BLL has fallen.</p>			

2. Provide additional postpartum care.

- Obtain a maternal or umbilical cord BLL at delivery and another maternal BLL one month after delivery.
- For information about the possible risks and benefits of breastfeeding to the newborn, consult a lead poisoning specialist.

**3. Coordinate newborn care with the pediatric health care provider.**

The NYC DOHMH recommends that the BLLs of lead-exposed newborns be monitored for the first 6 months of life as below.

**Recommended Blood Test Schedule for Lead-Exposed Newborns (Age 0-6 Months)**

<b>Maternal / Umbilical Cord BLL At Delivery (µg/dL)</b>	<b>Initial Venous Test</b>	<b>Follow-up Venous Tests</b>
0 – 5	None	Based on postpartum risk of exposure*
5 – 14	Within 1 month	Every 3 months
15 – 24	Within 1 month	Every 1 – 3 months
25 – 44	Within 2 weeks	Every 2 weeks – 1 month
≥45	As soon as possible	Depends on clinical management†

\* See Childhood Lead Poisoning, City Health Information, 2005; 24(9):59-64  
 † Collaborate with DOHMH and an experienced lead poisoning specialist

**INFORMATION FOR HEALTH CARE PROVIDERS**

- Fax reports of BLLs ≥10 µg/dL to (212) 676-6188 and call (212) 676-6379.
- Obtain lead poisoning information at DOHMH Web site [www.nyc.gov/lead](http://www.nyc.gov/lead) or call 311 and ask for the BAN-LEAD information line.
- View peer review panel report “Guidelines for the Identification and Management of Pregnant Women with Elevated Lead Levels in New York City” at DOHMH Web site [www.nyc.gov/lead](http://www.nyc.gov/lead).
- Call (212) 676-6100 to request a telephone consultation with a DOHMH physician about a lead-poisoned pregnant woman.

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