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PUBLIC HEALTH ADVISORY

To: Health Care Providers

From: Andrew Smith, SM, ScD, State Toxicologist

Subject: **Lead Poisonings Requiring Medical Chelation Treatment**

Date / Time: Thursday, January 16, 2020 at 1:15pm

Pages: 3

Priority: Normal

Message ID: 2020PHADV002

Abstract:

Between July and December 2019, four children ages 12 to 24 months were identified with blood lead levels ranging from 45 to 57 mcg/dL. Blood lead levels of 45 mcg/dL or higher are typically treated with medical chelation therapy to reduce blood lead levels. These are the first chelation cases identified in Maine since 2016. The children resided in Androscoggin, Cumberland, and York counties.

Key Points:

- Three of the four cases were identified through routine testing. One case was identified after an older sibling was identified with an elevated blood lead level.
- There is no safe level of lead in a child's body. Even low levels of lead in blood have been shown to affect IQ, ability to pay attention, and academic achievement.
- In Maine, lead poisoning is defined as a venous blood lead level of 5 mcg/dL or greater.

Recommendations:

- Test all children at ages 1 and 2 years, as now required by Maine law.
- Identification of new risk factors for lead exposure should prompt retesting.
- Perform timely confirmation of elevated capillary test results with a venous specimen. Maine CDC provides a full lead investigation of the child's home environment when a venous blood lead test result is 5 mcg/dL or greater.
- For children ages 3 to 5 years, assess need for blood lead testing annually using Maine CDC's Risk Assessment Questionnaire.
- For more information, consult Maine CDC's blood lead testing guidelines at https://www.maine.gov/dhhs/mecdc/environmental-health/eohp/lead/providers.shtml

Lead Poisonings Requiring Medical Chelation Treatment

Summary:
Between July and December 2019, four children were identified with blood lead levels high enough to warrant medical chelation treatment to reduce blood lead levels. These are the first chelation cases identified in Maine since 2016.

Case Details: The chelation cases were all males, between the ages of 12 and 24 months, enrolled in MaineCare, and living in dwellings built prior to 1950 – three in rental dwellings and one in a single-family, owner-occupied dwelling. These children resided in Androscoggin, Cumberland, and York counties. Initial capillary blood lead test results ranged from 28 to 46 micrograms of lead per deciliter of blood (mcg/dL). Confirmatory venous blood lead levels ranged from 45 to 57 mcg/dL. Three of the four cases had abdominal X-ray findings consistent with presence of lead paint chips. All cases had environmental lead hazards (lead dust and lead-based paint in poor condition) present in their dwellings. All cases were initially admitted to the hospital to begin chelation therapy and were discharged for continued out-patient oral chelation therapy once relocation to lead-safe housing was possible.

Case Identification: As of June 2019, Maine law requires testing of all children for blood lead at ages 1 and 2 years. Three of the four cases were identified during routine blood lead testing. One case was identified during a routine test at age 2 years after having a low blood lead level at age 1 year. One case was identified, despite a low blood lead level months earlier, when the child was tested again after an older sibling was identified as having an elevated blood lead level.

Background:
It is now rare to identify children with blood lead levels high enough to warrant medical intervention with chelation treatment (*i.e.*, a blood lead level of 45 mcg/dL or higher). Over the past 15 years, there have been an average of two chelation cases per year (range: 0 – 4 cases per year) in Maine. The management of these cases may require initial hospitalization in part to provide time to arrange relocation of the child to a lead-safe environment while undergoing out-patient oral chelation therapy.

Three of the four chelation cases were identified during routine blood lead testing, which underscores the importance of routine blood lead testing at 1 and 2 years of age. In 2018, just over 50% of 1-year-olds were tested for blood lead; just over 30% of 2-year-olds were tested for blood lead.

There is no safe level of lead in a child's body. Even low levels of lead in blood have been shown to affect IQ, ability to pay attention, and academic achievement. In Maine, lead poisoning is defined as a blood lead level of 5 mcg/dL or greater, which is also the U.S. Centers for Disease Control and Prevention's blood lead reference level. One-in-30 children enrolled in MaineCare tested for blood lead have confirmed levels of 5 mcg/dL or above; the same statistic for children not enrolled in MaineCare is 1-in-50.

Intervention:
The primary intervention for a child with a blood lead level that meets Maine's statutory definition of lead poisoning (5 mcg/dL or higher) is to identify and remove the sources of lead responsible for the child's poisoning. Maine Center for Disease Control and Prevention (CDC) provides a full lead investigation of the child's home environment when a venous blood lead test result is 5 mcg/dL or greater for children up to age 6 years. Maine CDC will also inspect all dwelling units in a dwelling when a child with a venous blood lead level of 5 mcg/dL or higher is identified as living in any unit with lead hazards within that dwelling.

Recommendations:

- Perform routine testing of all 1- and 2-year-old children, as now required by Maine law. Testing is required at both ages. A low blood lead level at age 1 year does not preclude an elevated level at age 2 years.
- Because blood lead levels can rise rapidly, identification of a new risk factor, such as a sibling diagnosed with lead poisoning, should prompt retesting, even after a recent low result.
- Perform timely confirmation of elevated capillary test results with a venous specimen in accordance with Maine CDC's blood lead testing recommendations. Maine CDC provides a full lead investigation of the child's home environment when a venous blood lead test result is 5 mcg/dL or greater.
- For children ages 3 to 5 years, assess need for blood lead testing annually using Maine CDC's Risk Assessment Questionnaire.
- For more information on blood lead testing, confirmation and follow-up testing, and risk assessment guidelines consult: https://www.maine.gov/dhhs/mecdc/environmental-health/eohp/lead/providers.shtml

Blood Lead Specimen Analysis and Reporting Requirements:

For children up to age 6 years, all specimens collected for blood lead analysis must be submitted to the State Health and Environmental Testing Laboratory for analysis, unless a health care provider or facility obtains approval from Maine CDC to perform in-office capillary blood lead testing. Providers approved for in-office testing must electronically report all in-office test results and associated patient information through ImmPact, Maine's Immunization Information System, within 48 hours. Providers are encouraged to immediately notify the Maine CDC Childhood Lead Poisoning Prevention Unit at 207-287-4311 for in-office capillary test results of 40 mcg/dL or higher to coordinate immediate venous confirmation testing.

References:

- Maine CDC's childhood lead poisoning prevention provider information web page: https://www.maine.gov/dhhs/mecdc/environmental-health/eohp/lead/providers.shtml
- Information about in-office blood lead testing, approval criteria, and reporting requirements: https://www.maine.gov/dhhs/mecdc/environmental-health/eohp/lead/ld300/in-office-testing.shtml
- U.S. CDC Childhood Lead Poisoning Prevention Program: https://www.cdc.gov/nceh/lead/
- American Academy of Pediatrics childhood lead exposure information: https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/lead-exposure/Pages/default.aspx