

## **Chapter 2**

# **Lead Testing Requirements and Recommendations**

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## Chapter 2: Lead Testing Requirements and Recommendations

### Key Points

- A blood lead test at ages 12 and 24 months is recommended for all NC children. This is required for children with Medicaid.
- Children with elevated blood lead levels should be re-tested according to the clinical follow-up schedule.
- Refugee children 6 months to 16 years should be tested at entry into the U.S. *and* 3-6 months after placement.
- Lead testing consists of an initial capillary sample (can be done with point-of-care analyzers) followed by a diagnostic (preferably venous) sample. If the parent or guardian refuses the venous draw, wash the child's hands well with soap and water to get a more accurate capillary sample. All diagnostic samples must be sent to an outside reference laboratory for analysis, regardless of sample type.
- Offices using POC analyzers are considered laboratories and are required by law to report blood lead results for children < age 6 years to NC CLPPP.

### General Population

It is recommended that all children have a blood lead test **at 12 and 24 months** of age at the clinic where they receive well child care (e.g., private, health department, community health center) Blood lead specimens should be collected by the child's primary care provider at well child visits or at other visits if not done at the well child check.

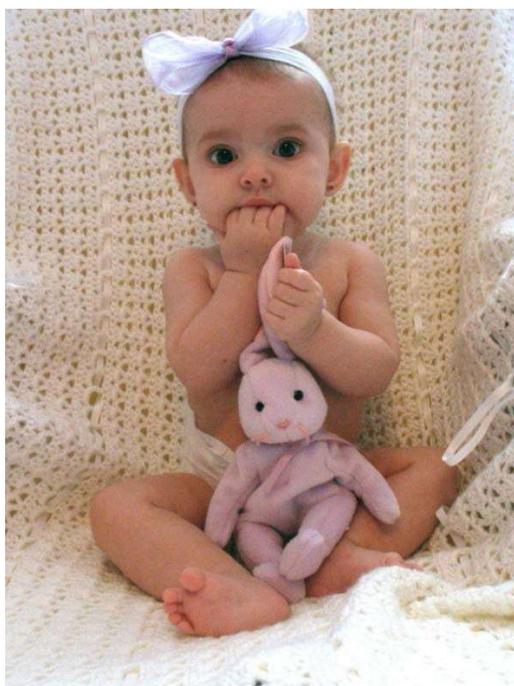
Children under six years of age who first enter the health care system between 25 and 72 months of age should have a lead screening test at their first visit if no record of prior lead testing is available. Although it is preferred that the assessment occurs at 12 and 24 months of age, there are acceptable ranges of ages during which screening may occur. For the 12-month screening, the acceptable range is from 9 through 18 months of age. For the 24-month screening, the acceptable range is from 18 through 30 months of age, with the goal being to conduct the screening as close as possible to 24 months of age.

Children identified as high risk for ongoing lead exposure (e.g., from a parental job or hobby that involves lead exposure or an unmitigated lead hazard in the child's environment) may warrant more frequent testing. Children with an initial abnormal test result should be retested as indicated by their blood lead level result (see **Follow up Schedule**).

**Childhood lead poisoning peaks at two years of age**, yet fewer children in North Carolina are tested at this age than at one year of age. Two-year-olds are at higher risk of lead poisoning than one year olds due to the increased mobility and curiosity of toddlers at this age. Research has shown little value to screenings done prior to one year of age, due to children's developmental stages with respect to mobility and hand-to-mouth behaviors. However, testing before 1 year of age may be appropriate for children who are more mobile or at risk of high lead exposure due to parental occupation or other risk factors.

Healthcare providers are encouraged to conduct a blood lead test on *all* children at 12 months and again at 24 months of age (universal screening). If universal screening is not practiced at your clinic, conduct risk-based screening at 12 months *and* 24 months of age to determine testing using **Form 3958: Lead Risk Assessment Questionnaire** [available in **Appendix D**]. Page 2 of the form lists zip codes in North Carolina that data has shown have a higher risk of lead poisoning for children. If the child lives in one of the high-risk zip code areas listed, they should be tested for lead, regardless of the answers on the risk assessment questionnaire. If the child lives in a low-risk zip code and all the answers on the risk assessment questionnaire are "No", the child is to be reassessed at 24 months of age. Any "Yes" or "I don't know" response on the questionnaire indicates the need to do a blood lead test. Children living in housing built before 1978 and children living in older homes undergoing renovation are at particular risk.

## Special Populations at Higher Risk for Lead Poisoning



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### **Medicaid, Health Choice, and Women, Infants and Children (WIC) Program Participants**

All children enrolled in Health Check (Medicaid), Health Choice or the Special Nutrition Program for Women, Infants and Children (WIC Program) are **required** to have a blood lead test at 12 and 24 months of age. Children between 25-72 months must be tested if they have not previously been tested.

When children present for a WIC certification between 12 and 36 months old, WIC staff are to assess whether blood lead testing was performed by the child's health care provider. If the lead test was not done or if the test result is not available, a blood lead test should be performed only when children are having a hemoglobin or hematocrit test done at the local agency during the WIC certification visit. Otherwise, the child should be referred to the agency's lead program staff or to the child's medical home, depending on the agency's

protocol. To avoid unnecessarily testing a child twice in one year, WIC staff should ask the parents to notify their child's medical home that a lead test was already performed.

## **Refugee Children and Immigrants**

The prevalence of elevated blood lead levels among newly resettled refugee children is higher than that for US-born children. This is attributed to several possible factors: (1) exposures in their previous country of residence; (2) malnutrition, particularly deficiencies in iron, calcium and zinc; (3) living and playing in high-risk areas in the US, such as in and around homes built before 1978; and (4) exposure to lead-containing foods, candies, ceramics, utensils, cosmetics, ceremonial powders, and traditional remedies.

CDC recommends that all refugee children **6 months to 16 years of age** are to be tested at the time of arrival to the United States. Blood lead testing should be repeated 3 to 6 months after placement in a permanent residence **regardless of initial test results for children 6 months to 6 years old**. See **'Refugee Children' Appendix G** for more details. Repeat testing has revealed elevated blood lead levels in some refugee children even when initial test results were not elevated. Chronic malnutrition and pica, which is common among certain refugee populations, put some of these children at greater risk of lead poisoning *after* placement in permanent residences. Therefore, this repeat blood test is considered to be a "medical necessity."

Refugee children **younger than 6 years of age** should also undergo nutritional assessments. Iron deficiency should be corrected. Calcium and zinc deficiencies may also increase the risk of lead poisoning. Consider daily pediatric multivitamins with iron for refugee children 6 months to 6 years of age and WIC referral if eligible. See **'Refugee Children' Appendix G** for more details.

In New Hampshire in 2000, a two-year old girl died of cerebral edema due to lead poisoning. She was from Sudan; the family had come to the U.S. as refugees after living in Egypt. The child had iron deficiency with anemia and observed pica. An environmental investigation traced the source of lead to deteriorated paint and plaster in the family's U.S. apartment which was built in the 1920's. This sad case illustrates the need to test refugee children for lead poisoning after placement as well as at entry. *[CDC. Fatal Pediatric Lead Poisoning—New Hampshire, 2000. MMWR 2001;50: 457-9]*

The testing recommendations for refugee children also apply to immigrant children and children of immigrant parents from less developed countries. They, like refugees, are at increased risk for lead poisoning by having lived in or traveled to their country of origin or by living in sub-standard housing in the United States.

## International Adoptees

The CDC recommends that all internationally adopted children have a blood lead test during their first medical examination in the U.S. *and* at 12 and 24 months of age.

Evidence suggests that a significant proportion of immigrant and adopted children have elevated blood lead levels. Risk of elevated blood lead levels varies by country of origin.

## Indications for Additional Testing

Blood lead testing should be done at times other than the routine testing schedule if it is suspected that a child faces increased risk for lead exposure. Indications for additional testing include:

- ✓ **Increased likelihood of exposure due to housing.** A child's risk for lead exposure may increase because *the family has moved* to older housing or to a geographic area with a higher prevalence of lead poisoning or older housing, or because the child lives in an older home that has recently been repaired, remodeled or renovated. High risk zip codes in North Carolina are listed on the back of the **Form 3958: Lead Risk Assessment Questionnaire [Appendix D]**.
- ✓ **Parental request.** Parents may express concern about their children's potential lead exposure because of residence in older housing, nearby construction or renovation, an elevated blood lead level (EBL) in a neighbor's child, or other possible exposures. Such information may be valuable in highlighting potential exposure. A blood lead test should be performed if there is any reason to suspect that lead exposure has occurred.
- ✓ **Parental occupation or hobby.** If a child's parent is exposed to lead at work, they may inadvertently bring home lead dust, thus exposing the child. There are lead producing industries in North Carolina and children have been lead poisoned due to parental take-home exposures. Also, hobbies such as bullet making, target shooting, and stained-glass making can expose children to lead. See **Chapter 1** for more occupations and hobbies that can create a lead exposure risk.

## Testing Methodology

Capillary blood lead samples are adequate for the initial blood lead test. Venous blood lead samples are strongly recommended for confirmation of all blood lead test results  $\geq 5\mu\text{g/dL}$ . [See the **Quick Reference Guide** for the diagnostic testing schedule based on the initial blood lead test result.]

The Centers for Disease Control and Prevention (CDC) now has an updated video demonstrating the best procedures for capillary sampling, entitled "Mission Unleaded: How to test children for lead with maximum accuracy," which can be found at:

<https://www.youtube.com/watch?v=g2p2qREch9g>

**Please note:** Blood lead test results should be truncated to the whole number when determining the type of referrals to make and timing of follow-up. For example, test results between 4.1 to 4.9µg/dL are truncated to 4µg/dL, not rounded. Truncating these values allows for comparability with results reported from other laboratories and for submission to the National Lead Surveillance System at the Centers for Disease Control and Prevention.

Report all blood lead test results to parents/guardians and document notification. Reporting blood lead test results not only informs the parent of the child's blood lead status but also facilitates prevention and education. Parental notification may also stimulate questions and feedback from the parent to the medical provider as to what the parent/guardian understands about the potential health effects of lead and how lead exposure may affect their child. It also provides the parent with the knowledge to seek further testing options and measures to prevent future lead exposure. Educational materials are available online at <http://nchealthyhomes.com/lead-poisoning/> or by calling (919) 966-2463.

## Laboratory Analysis of Blood Lead Levels

### State Laboratory of Public Health

The State Laboratory of Public Health will analyze blood lead specimens for all children less than six years of age (and refugee children through age 16 years) at no charge. Providers requesting analysis of specimens from children outside of this age group will need to contact the State Laboratory of Public Health at 919-807-8878 *before sending a specimen* to provide a justification for sending it and receive further instructions.

State Laboratory test results feed directly into the NC Division of Public Health's blood lead surveillance system, NCLEAD, removing the need for burdensome data entry by providers.

The Medicaid program encourages all providers to utilize the State Laboratory of Public Health for blood lead tests on children (under 6 years of age) because it will:

- ◆ Expedite reporting of blood lead test results for Medicaid recipients
- ◆ Contribute to the creation of a central database on blood lead testing
- ◆ Help assess the extent of North Carolina's lead problem
- ◆ Save money for the Medicaid program

### Point-Of-Care (POC) Blood Lead Analyzers

A growing number of health care providers in North Carolina are using point-of-care (POC) blood lead analyzers to test children for lead poisoning. Use of these analyzers provides an immediate test result, which reduces delays in obtaining diagnostic (i.e., confirmatory) samples to confirm elevated initial results. The diagnostic **venous** sample can be drawn immediately and sent to an outside laboratory for analysis, thereby

removing the difficulty of bringing the patient back for the venous blood draw on a separate day. In May of 2017, the U.S. Food and Drug Administration (FDA) warned that the current POC analyzer on the market should not be used to analyze **venous** samples due to inaccurate results. Use of this POC lead analyzer for capillary (fingerstick) samples is still approved.

<https://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/ucm558733.htm>

The Clinical Laboratory Improvement Amendments (CLIA) designates facilities that use a POC lead analyzer as laboratories.

**Did you know?** All clinics that use a POC analyzer for lead testing are **required** to report all blood lead test results for children less than six years old residing in North Carolina to the North Carolina Childhood Lead Poisoning Prevention Program (NC CLPPP).

To arrange for reporting blood lead test results, please contact Tena Hand at 919-707-5933 ([tena.hand@dhhs.nc.gov](mailto:tena.hand@dhhs.nc.gov)) or Melanie Napier at 919-707-5861 ([melanie.napier@dhhs.nc.gov](mailto:melanie.napier@dhhs.nc.gov)).

NC CLPPP requires that all diagnostic test specimens be analyzed at a reference laboratory (State Laboratory or another laboratory that uses a high complexity analysis method). Test results obtained using the POC lead analyzer cannot be accepted as a diagnostic result.

## Required data for Reporting

There is a legal requirement in North Carolina that blood lead test results for children under six years of age should be reported with the following demographic data:

- child's full name,
- date of birth,
- primary street address,
- city and zip code,
- sex,
- race,
- ethnicity
- Medicaid number (if any).



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For full details of required laboratory reporting, see **Table 1: North Carolina General Statutes**.

**TABLE 1: North Carolina General Statutes \*revised July 2017\***

**§ 130A-131.7. Definitions.**

- (3) "Confirmed lead poisoning" means a blood lead concentration of 10 micrograms per deciliter or greater determined by the lower of two consecutive blood tests within a 12-month period.
  
- (5) "Elevated blood lead level" means a blood lead concentration of 5 micrograms per deciliter or greater determined by the lower of two consecutive blood tests within a 12-month period.

**§ 130A-131.8. Laboratory Reports of blood levels in children.**

(a) All laboratories doing business in this State shall report to the Department all environmental lead test results and blood lead test results for children less than six years of age and for individuals whose ages are unknown at the time of testing. Reports shall be made by electronic submission within five working days after test completion.

(b) Reports of blood lead test results shall contain all of the following:

- (1) The child's full name, date of birth, sex, race, ethnicity, address, and Medicaid number, if any;
- (2) The name, address, and telephone number of the requesting health care provider;
- (3) The name, address, and telephone number of the testing laboratory;
- (4) The laboratory results, whether the specimen type is venous or capillary; the laboratory sample number, and the dates the sample was collected and analyzed.

**§ 130A-131.9A. Investigation to identify lead poisoning hazards.**

(a) When the Department learns of confirmed lead poisoning, the Department shall conduct an investigation to identify the lead poisoning hazards to children and pregnant women. The Department shall investigate the residential housing unit where the child or pregnant woman with confirmed lead poisoning resides. The Department shall also investigate the supplemental addresses of the child or pregnant woman who has confirmed lead poisoning.

(a1) When the Department learns of an elevated blood lead level, the Department shall, upon informed consent, investigate the residential housing unit where the child or pregnant woman with the elevated blood level resides. When consent to investigate is denied, the child or pregnant woman with the elevated blood lead level cannot be located, or the child's parent or guardian fails to respond, the Department shall document the denial of consent, inability to locate, or failure to respond.

**§ 130A-131.9C. Abatement and Remediation.**

(a) Upon determination that a child less than six years of age or a pregnant woman has a confirmed lead poisoning of 10 micrograms per deciliter or greater and that child or pregnant woman resides in a residential housing unit containing lead poisoning hazards, the Department shall require remediation of the lead poisoning hazards. The Department shall also require remediation of the lead poisoning hazards identified at the supplemental addresses of a child less than six years of age or a pregnant woman with a confirmed lead poisoning of 10 micrograms per deciliter or greater.