

Chapter 3

State Laboratory Procedures

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About Blood Lead

Childhood lead poisoning is a major, preventable environmental health problem. The persistence of lead poisoning, in light of present knowledge about the sources, pathways and prevention of lead exposure, continues to present a direct challenge to clinicians and public health authorities. As a result of industrialization, lead is common in the environment. Lead has no known physiological value and children are particularly susceptible to its toxic effects. Most poisoned children have no apparent symptoms, and consequently, many cases go undiagnosed and untreated. Lead poisoning is widespread and is not solely a problem of poor, inner city or minority children. No socioeconomic group, geographic area, racial or ethnic population is spared its effects.

Blood lead testing is encouraged as an important element of a comprehensive program to eliminate childhood lead poisoning. The goal of such testing is to identify children who need individual interventions to reduce their exposure.

No safe level of lead in a child's body has been identified. At higher levels (≥ 70 $\mu\text{g}/\text{dL}$), lead exposure is an acute condition and can have devastating health consequences, including encephalopathy, seizures, coma and even death. New data indicate adverse effects of lead exposure in children at blood lead levels previously believed to be safe. As a result, in 2012, the Centers for Disease Control (CDC) intervention level of 10 $\mu\text{g}/\text{dL}$ was lowered to 5 $\mu\text{g}/\text{dL}$.

The North Carolina State Laboratory of Public Health (NCSLPH) now performs the newest methodologies to detect lead present in blood at lower levels including ICP/MS (Inductively Coupled Plasma Mass Spectrometer). In addition, a multi-tier approach to follow-up has been adopted with an overall goal of reducing children's blood lead levels.

Attention:

The North Carolina State Laboratory of Public Health will not process blood lead specimens collected on patients who are not residents of North Carolina. If any serious elevations were detected, the North Carolina Childhood Lead Poisoning Prevention Program would not have any jurisdiction in another state.

Ordering Supplies

The NCSLPH furnishes, at cost, mailers for collection and shipment of samples and specimens. These mailers are carefully selected by the Laboratory to meet U.S. Postal Service/DOT diagnostic specimen shipping and packaging regulations to minimize problems such as leakage or breakage, and to identify the type of specimen or sample through color coding. Color coding speeds up the process of sorting and routing thousands of specimens and samples received daily. The mailers are provided for shipping specimens or samples only to the State Lab.

The NCSLPH Online Supply Ordering System **must be used to order supplies**. You can access supplies by going to this website:

[https://slphreporting.ncpublichealth.com/labportal/\(jhc0jr30codoh454qb3ppzb\)/Loginform.aspx](https://slphreporting.ncpublichealth.com/labportal/(jhc0jr30codoh454qb3ppzb)/Loginform.aspx)

You must have an account to access the system. To set up a new account please call (919)733-7656 or follow the instructions for setting up a new account on the website.

Specimen Identification, Collection and Shipment

A. DHHS form #3707

Blood Lead Analysis Form and specimen collection device kit are available from The NCSLPH website at:

<http://slph.ncpublichealth.com/Forms/3707-BloodLead-201609.pdf>

It is imperative that all of the following information be given: last name, first name, patient number or social security number, address, date of birth, race, sex, Medicaid number, submitter name, address and tax identification number (EIN#), specimen collection date, initial or follow-up blood lead test and EDTA capillary/venous tube blood specimen.

Tips on filling out Form 3707 Completely

1. Use Social Security and Medicaid numbers.
2. County should be coded as child's county of residence, not the county in which the specimen was obtained.
3. Print or type information clearly.
4. Place labeled capillary/venous tube in a plastic bag, keeping Form 3707 separate from specimen.
Place sample and Form 3707 into approved mailing container. Do not mail in envelopes or other mailing devices.
5. Send specimen to NCSLPH as soon as possible. If transport is delayed, refrigerate specimen. Specimen **MUST BE RECEIVED** by the NCSLPH within four weeks (28 calendar days) from date of collection.

Blood Lead CPT Code: 83655

*ICD-9 Code: V 82.5 [Screening for chemical poisoning
(Ex: lead) and other contamination]*

*ICD-10 Code: Z 13.88 [Encounter screen for disorder due
to exposure to contaminants]*

B. Collection of Finger Stick Sample

1. To remove lead residue from the skin, wash child's hands thoroughly with soap and water. Rinse well. Dry.
2. Grasp the child's hand so that the thumb of the blood drawer is across the top of the child's fingers.
3. Hold the child's hand so that the palm faces up.
4. Use child's middle or ring finger for sample collection.
5. Using an alcohol wipe, briskly scrub the child's fingertip for 20 seconds.



Note that alcohol wipes alone will not remove lead residue from the child's hands, so skipping the handwashing step (#1) may yield an artificially elevated blood lead test result.

6. Using dry gauze, wipe scrubbed area once.
7. Use lancet to stick finger slightly left of center.
8. Use dry gauze to wipe off the first drop of blood.
9. After specimen collection, care of puncture site should be consistent with your institution's procedures.

C. Collection of Blood Sample

1. Continuing to grasp the finger, touch the tip of the capillary of collection device to the beaded drop of blood.
2. Capillary must be held continuously in a horizontal position during specimen collection to prevent air bubbles from forming in the capillary tube.
3. After 3-4 drops of blood fall from the full capillary into the capillary tube, you should have enough blood (150-250 µg/L).
4. Turn capillary unit immediately to a vertical position to allow the blood in the capillary to flow into the tube.
5. Remove capillary with holder at the same time. Close capillary tube with attached cap.
6. Agitate the specimen to mix the anticoagulant through the blood.
7. Properly label with patient's first and last name. Place in a refrigerator until specimen is shipped.

D. Shipment

The NCSLPH must receive the specimen within 28 days of collection; however, immediate shipping is recommended to ensure specimen integrity and suitability for analysis. If not shipped immediately, store in refrigerator.

Place the specimen in a plastic bag with separate pouch for requisition. Place return address label on outside of container. Packaging and shipping instructions are available from the NCSLPH website at:

<http://slph.ncpublichealth.com/Forms/InstructionsforBloodLeadShipment-050317.pdf>

Receiving Results of Blood Lead Tests

Specimens are usually analyzed and reported on the day received by the NCSLPH. Online results are available from the NCSLPH website at:

<https://slphreporting.ncpublichealth.com/lims/ClinicalLims/Login.aspx>

Results are reported in micrograms per deciliter ($\mu\text{g}/\text{dL}$) of whole blood.

The range of results reported is $<1 \mu\text{g}/\text{dL}$ to $100 \mu\text{g}/\text{dL}$. Requisition forms are retained by the NCSLPH for two years plus the current year and are filed according to laboratory accession number. Occasionally, results are given as one of several "Unsatisfactory Specimen Codes." These require submission of another specimen for analysis.

Unsatisfactory Descriptions

BROKEN IN TRANSIT - NEEDS TO BE REPEATED
QUANTITY NOT SUFFICIENT - NEEDS TO BE REPEATED
GREATER THAN 28 DAYS OLD - NEEDS TO BE REPEATED
RECEIVED CLOTTED - NEEDS TO BE REPEATED
NO SPECIMEN RECEIVED - NEEDS TO BE REPEATED
NAME ON SPECIMEN AND FORM DO NOT MATCH-NEEDS TO BE REPEATED
DATE OF BIRTH ON SPECIMEN AND FORM DO NOT MATCH-NEEDS TO BE REPEATED
NO NAME ON SPECIMEN-NEEDS TO BE REPEATED
OUT OF STATE RESIDENT, INELIGIBLE FOR TESTING
PERSON IS PAST THE AGE LIMIT AND INELIGIBLE FOR TEST

For more information, about the North Carolina State Laboratory of Public Health, download *SCOPE: A Guide to Laboratory Services* at

<http://slph.ncpublichealth.com/doc/SCOPE-Final-11-02-16.pdf>

Please call for any questions or concerns:

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