

BLOOD LEAD SPECIMEN COLLECTION GUIDELINES

When collecting blood lead specimens, please refer to the laboratory used by your local health department and follow their correct collection guidelines.

CDC website for Guidelines for collecting and handling blood lead samples: http://www.cdc.gov/nceh/lead/training/blood_lead_samples.htm.

Medtox website for Guidelines for collecting and handling blood lead samples video: www.Medtox.com, go to Medical testing, go to Filter paper testing, go to view collection video.

Attention: Steps performed before, during, and after collection are of paramount importance.

- Lead is everywhere in the environment. Therefore, great care must be taken to remove lead from the hands of the patient and collector prior to collection. It will also prevent contamination of your collection site and work environment. Prepare your worksite in a sterile fashion prior to washing patients and your own hands for the specimen blood draw.
- It is recommended for screening children who are younger than one (1) year of age to use the heel of the infant as a puncture site. Guidelines for this procedure can be found at the National Committee on Clinical Laboratory Standards.

NOTE: The finger stick collection technique is more prone to environmental contamination than the venous and will affect specimen results. Special precautions are needed to prevent contamination.

Contamination errors are common in trace metal analysis, so precautions must be taken to eliminate or reduce them. Lead can be picked up by accident from work surfaces, from printed materials or from the hands of the collector. It can also come from the hands and the clothes of the child you are screening. The key to effective lead screening is to collect specimens that have not been contaminated.

To reduce the odds of contaminating your sample:

- Take special care when preparing your test area and supplies, use sterile fashion.
- As much as possible, use only supplies that have been certified as lead free.
- Label the liquid soap bottle that will be used for lead testing, “Use for Lead Testing Only”.
- Handle all equipment with powder-free gloves. Powdered gloves may contaminate your sample.
- Keep all screening supplies—which include your lancet, gauze pads, band aids, tissues, alcohol pads, and micro-collection vials—in a clean plastic box with a snap lid for storage.
- When using bulk-packaged micro-collection vials, carefully pour the vials into a re-sealable plastic bag and close to store. Individually packaged kits or a full box of micro-collection vials can be stored as they are. All micro-collection containers from open packages should be stored in a covered plastic container.
- There are many types of micro-collection vials you can use to collect samples, but all must be prescreened or **certified as lead-free**.

- For Capillary tubes, most vials contain 200 to 300 micrograms per deciliter of blood, EDTA or Heparin tubes are required.
- For Capillary Scoop micro-collection vials, these should be used with extreme caution because they have a high potential for contributing to lead and tissue contamination.
- Choose a lancet with the appropriate depth to collect the proper amount of blood for the micro-collection vial you are using. Also, use retractable lancets that cannot be used more than once to avoid sticking a child unnecessarily

Practice universal precautions and wear protective equipment.

Specimen Collection Technique

Preparing the Collection Area:

- Before you begin, fill out your laboratory request form completely and write the child's name on the vial label or front of filter paper collection card by applying bar-coded sticker from requisition into box on card, or writing name and patient ID number on card. **NOTE: Information must match the requisition and cards without label or identifying information will NOT be tested.**
- Information required for lab reporting and that should be placed on lab requisitions include: First Name, Last Name, Middle Initial, Date of Birth, Patient Address, City, State, Zip Code, Social Security #/ Medicaid/Passport #, Child/Prenatal/Adult, and collection date.
- Prepare your collection area with a clean, disposable pad in a sterile fashion as to keep area contamination free. Always have the following on hand:
 - Two gauze pads
 - Two alcohol pads
 - A self sheathing lancet
 - A micro collection vial or filter paper
 - Specimen identification label
 - Liquid soap
 - Bandages
 - Biohazard bag
 - Accessible sharps container

It's important that the technician/ nurse responsible for obtaining the blood sample is familiar with the techniques for obtaining a high quality blood lead sample, see CDC video at http://www.cdc.gov/nceh/lead/training/blood_lead_samples.htm

Capillary/Finger Stick Technique

1. The nurse should help the child **thoroughly** wash their hands (or foot) with soap and water, as the collector is also washing their hands, paying special attention to the fingertips and under the finger nails and on nail beds, (absolutely do not use gel type sanitizers). If the child will not let the nurse wash their hands, the parents should thoroughly wash their own hands and then the child's hands, again paying attention to area of the nails.
2. Rinse hands thoroughly.

3. Since recycled and colored towels may have traces of lead, it's best to let hands **air dry** or use white, **lead free towels**.
4. To avoid contamination do not let the child's fingers touch any surface, you may need to hold the child's hand in a gauze or paper towel until you get to your work area.
5. Although you can draw a sample from any finger, we suggest working with the ring finger. The ring finger is less calloused and somewhat less sensitive. Plus, it's easy to palpitate above the puncture to produce and increase blood flow.
6. Massaging the child's hand and the lower part of the finger before you make your puncture will calm the child and stimulate blood flow.
7. Clean the finger that you will puncture with an alcohol pad. If you see dirt on the pad, **use a new alcohol pad until clean**.
8. Allow finger to air dry or wipe dry with sterile gauze. NOTE: **If alcohol remains on the finger, it will prevent the blood from forming a well-rounded drop and will contaminate the sample.** Wiping will also prevent alcohol from getting into the cut and stinging. Remember to keep the finger isolated from the rest of the hand.
9. When you are ready for blood collection, hold the child's finger in a downward position.
10. Use the appropriate blade and lance the palm side of the finger. Do not lance the side or the tip.
 - a. **Correct finger stick:** Puncture across grooves of fingerprint; a round drop of blood will form
 - b. **Incorrect finger stick:** Puncture parallel to grooves of fingerprint; blood runs down finger; will not form into a drop

This enables the blood to form as a drop on the fingertip. If the puncture is parallel to the lines of the fingerprint, the blood will not form as a drop but will run down the finger making correct collection impossible.

11. Promptly blot the first drop of blood on a gauze pad and discard in the appropriate container. **The first drop of blood is likely to contain excessive tissue fluid that can alter test results.**
12. To collect a droplet of blood, keep the child's finger in a downward position and gently massage it to maintain blood flow. If blood flow is inadequate, gently massage the child's finger to stimulate more flow, but don't squeeze the finger because tissue fluid may dilute the sample. Avoid strong, repetitive pressure and do not scrape the finger during collection.

Capillary Tubes/Vials Collection

- Hold the micro-collection tube at a 10 degree angle below the collection line. Touch the tapered end of the tube into the droplet of blood and not directly on the skin. Capillary action will cause the blood to fill the tube. As the blood starts entering the capillary tube, be careful not to allow air bubbles to enter. You will need to collect your sample within **two minutes** to avoid clotting.
- Also avoid collecting smeared blood or blood that has run into the cuticle or nail area.

- Depending on the micro-collection vial you use, the amount of blood you collect will vary. **Fill tube to the appropriate line** in order to have both the correct anticoagulant-to-blood ratio and to supply a sufficient amount of blood to the lab for testing.
- **Seal** the micro-collection vial and gently **invert the container 7 to 10 times** to prevent clot formation. Clots can render the specimen unsuitable for testing.
- Carefully place the child's identification label on the micro-collection vial vertically. If the label is not fixed vertically, the laboratory will not be able to read it.

Filter Paper Collection

Lead testing requires that *a SINGLE large drop of blood FREELY falls* and is absorbed uniformly by the filter paper. Do not scrape, smear, smudge, wipe or touch finger or blood to the filter paper, these specimens will be rejected.

Collect **at least two large, separate blood drops** that:

- Evenly saturate the filter paper, i.e., the spot will appear the same on front and back of the paper (see examples, p. 2 on Medtox Guideline examples). Evaluate the sample collection. Examine the back side of the filter paper to ensure that the blood has soaked evenly through to the paper. If NOT acceptable, repeat finger stick and recollect sample on a new sample card.
- Are about the size of the black circles ($\frac{1}{2}$ inch diameter). **NOTE: Blood spots do NOT have to be within the black circles but must be large enough for testing (2 spots with minimum $\frac{3}{8}$ inch diameter).** If drops are **free falling**, the drop will be large enough to read, do not touch blood or finger to paper.
- **NEVER put a 2nd drop of blood on top of a spot of blood already on the paper** (i.e., multiple drops), which makes the collection unacceptable for testing and will be cancelled as a smear, non-homogeneous, or unsuitable (see examples, p. 2 on Medtox examples).
- If a **hemoglobin test** is also requested, a 3rd **acceptable** free falling blood spot is required. A "HGB" circle is provided as a guide on the white Pediatric Lead/Hemoglobin blood sample card, however can be anywhere in the collection area as long as it does not overlap another blood drop.
- **Dry collection Card:** Allow the opened collection Card to air dry for **at least 2 – 5 minutes**.
- Place the dry card into a plastic bag and seal. **NOTE: Samples received wet CANNOT be tested—** occurs when cards are immediately placed into plastic bag or when filter paper is saturated with too much blood. Please let these cards dry.

13. Ship specimen promptly per protocol of the laboratory.

When the child's blood level results are received from the laboratory, consult PHPR Lead section for intervention guidelines according to blood lead results.