# Specimen Collection

Proper specimen collection guidelines have been developed by the National Committee for Clinical Laboratory Standards (NCCLS). NCCLS has published a consensus document entitled “Approved Standards: Blood Collection on Filter Paper for Neonatal Screening Programs.” The most current publication of this document is LA 4-A3 Volume 17 No. 16. Louisiana Genetics Diseases Program follows the guidelines of this publication for newborn screening specimen collection.

The NCCLS publication specifies the preferred method of specimen collection, i.e., blood applied from the heel stick directly to the Lab 10 filter paper. This procedure is given below.

See the Whatman® Neonatal Screening procedure, this section, for illustrated step-by-step instructions

## Gather Supplies

- Disposable lancet approximately 2.0 mm (shorter for premature and low birth weight infants)—automated devices may be used
- Sterile alcohol pads, 70% isopropanol—avoid other anti-microbial agents and disinfectants as they may adversely affect test results
- Sterile, individually wrapped gauze pads—2
- Powder-free gloves
- Biohazard container, clearly marked
- Sharps container—puncture proof with lid
- Lab 10 Form (most current year form)

## Source of Blood for Specimen

The blood for the NBS must be collected from the most medial or lateral portion of the plantar surface of the heel.

- Avoid using the finger, toe or posterior curvature of the heel as the available lancets could easily damage the bone. Also avoid the arch (may result in injury to nerves, tendons and cartilage), previous puncture sites, and edematous or swollen areas.

## Preliminary Steps

See above for instructions on completing the Lab 10 form.

## Precautions

- Avoid touching the area within the circles on the Lab 10 specimen collection form (filter paper section). Water, feeding formulas, antiseptic solutions, glove powder or other materials should not be allowed to come into contact with the filter paper before or after use.
- Confirm the identity of the infant.
- Wash hands vigorously before proceeding.
- Take appropriate precautions for handling blood and disposing of used lancets.

## Site Preparation

Warming the skin-puncture site can increase blood flow. This can be accomplished by applying a warm, moist towel or diaper for 3 minutes. Acceptable heel warming devices are also commercially available. It is helpful to position the infant so that the legs are lower than the heart.

- Temperature of warming device should be no higher than 107.6º F (42º C).

## Cleaning the Site

The skin should be cleaned with 70% isopropanol pad. Allow the skin to air dry.

- Alcohol residue remaining on the skin can dilute the specimen and adversely effect tests results.

## Puncture

1. To obtain sufficient blood flow, puncture the infant's heel with a sterile lancet to a depth of approximately 2.0 mm. Scalpel blades must not be used.

2. Wipe away the first drop of blood with a sterile gauze. It may be contaminated with tissue fluid, causing an inaccurate test result.

3. Allow a large drop of blood to form. Apply gentle pressure with the thumb and ease intermittently as drops of blood form. Milking or squeezing the puncture may cause hemolysis of the specimen or result in tissue contamination, invalidating the test result.

4. Touch the filter paper gently against the large blood drop, and, in one step, allow it to soak through to completely fill the preprinted circle on the filter paper. Never touch the filter paper to the puncture site.

5. Apply blood to only one side of the filter paper. Layering or application of successive drops of blood to the same printed circle causes caking, which can falsely elevate results.

6. Examine both sides of the filter paper to assure that the blood uniformly penetrated and saturated the paper. Both sides should be uniform with no white areas within the spot.

7. Continue to fill the circles until all are collected. Failure to collect the appropriate amount of blood may require that the specimen be recollected.

8. If the blood flow stops before the circles are filled, repuncture the infant at a different site on the heel, still positioned at the medial or lateral area of the heel, and fill the remaining circles, starting with a clean circle. Sending in a useable sample the first time will benefit everyone.

9. After collection is completed, elevate the infant's foot above the body. Press a sterile gauze pad against the puncture site until the bleeding stops. Do not use adhesive bandages as they may damage the newborn's sensitive skin.

**Following Collection**

1. Allow blood specimen to air dry on a horizontally level, nonabsorbent, open surface for at least three (3) hours at room temperature (59º F to 72º F) away from direct sunlight. Avoid touching or smearing the blood spots. Do not heat, stack or allow to touch other surfaces. Drying racks may be used that will allow stacking specimens, without touching, in a horizontal position.

2. When drying is complete, use the flap of the Lab 10 form to cover the specimen area and prevent exposure to environmental contaminants. Do not place them in any type of plastic bag.

3. Place the Lab 10 forms in an envelop to mail.

- Use paper or Tyvek envelop for mailing.
- If stacking is necessary for mailing, the DRIED spots should be rotated opposite the blood spots on the cards immediately above and below in the stack.
- Do not fold the Lab-10 forms.

4. Transport or mail the Lab 10 forms to the Louisiana Office of Public Health Laboratory within 24 hours after collection by mail, priority mail, FedEx, or UPS.

- Specimens must reach the laboratory within 10 days of collection.
- Mail to:

| Standard Delivery: | Overnight & courier service: |
|---|---|
| Central Laboratory, 7th Floor<br>P.O. Box 60630<br>New Orleans, LA 70160-5371<br>Ph. (504) 568-5070 | Central Laboratory<br>325 Loyola Avenue<br>New Orleans, LA 70125<br>Ph. (504) 568-5070 |

**At the Lab**

- Medical Technologists in the lab look at each and every specimen received in the lab.
- Every effort is made to accept a specimen. Only specimens which may cause an unreliable test result are rejected.
- See the Whatman® Simple Spot Check guide, this section for illustrations of satisfactory and unsatisfactory specimens
- The most common causes of unsatisfactory specimens are:
    - Quantity insufficent
    - Filter paper scratched
    - Circle oversaturated
    - Specimen not dried
    - Specimen appears diluted, discolored or contaminated
    - Specimen exhibits serum rings
    - Specimen appears clotted or layered