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Newborn Bloodspot Screening Specimen Collection

Newborn Screening Follow-up Program

Prevention and Health Promotion Administration
Office of Genetics and People with Special Health Care Needs




Mission and Vision

- **Mission:** The mission of the Prevention and Health Promotion Administration (PHPA) is to protect, promote and improve the health and well-being of all Marylanders and their families through provision of public health leadership and through community-based public health efforts in partnership with local health departments, providers, community-based organizations, and public and private sector agencies, giving special attention to at-risk and vulnerable populations.
- **Vision:** PHPA envisions a future in which all Marylanders and their families enjoy optimal health and well-being.

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What is Newborn Bloodspot Screening?

- **Newborn Bloodspot Screening (NBS)** is a service provided by the Maryland Department of Health for families with new babies.
- NBS identifies newborn babies with certain rare, serious disorders of body chemistry that if not detected early can cause mental retardation, serious illness, or even death of the baby.
- NBS tests for **over 30 core conditions**.

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It’s not just a “PKU” anymore.

- **PKU (phenylketonuria)** was the first disorder that could be identified using dried blood spots.
- **NBS screens for** certain endocrine disorders, hemoglobin disorders, cystic fibrosis, and disorders breaking down lactose, fats and proteins.

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Is consent required for NBS?

- Newborn bloodspot screening must be offered to all babies born in Maryland.
- It is the birth facility's responsibility to educate parents about the purpose for newborn bloodspot screening.
  - ***Written consent is no longer required.***
  - Documentation is needed ***only if the parent refuses*** newborn screening.

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NBS Refusal Form

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- ***The refusal must be in written form with a parent's signature*** indicating they have been informed of the risks and benefits of newborn bloodspot screening and have chosen not to have their baby tested.
- The NBS Follow-up Unit must be notified ***within 12 hours*** of refusal. We will contact the family and discuss risks and benefits of newborn screening.
- **Fill out refusal form available on our website utilizing the cognito form link here**. Fax is no longer required. The refusal can be accessed and submitted via the cognito form.

What should parents know about NBS?

Parents should know:

- NBS is designed to identify a possible disorder before any symptoms are present.
- Most of the disorders are rare.
  - The most common disorders identified on NBS in Maryland are congenital hypothyroidism and sickle cell disease.
- Although rare, some of the disorders are life-threatening and can cause the baby to become ill very fast and even die before the family realizes there is something wrong.

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When is NBS performed?

- Unless the baby is in the NICU, the first NBS should be collected after the baby has had at least 24 hours of feeding.
- The first specimen is usually collected in the birth hospital. However, babies born at home, or discharged early, may have their initial NBS collected at the provider office.
- In Maryland, our screening process is based on two specimens. The second NBS should be collected between 10 and 14 days of age, typically by the baby's pediatrician.

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When is NBS performed for NICU babies?

Specimens are usually collected:

- Upon admission to the NICU
- 2-3 days of age
- 10 days of age
- 1 month of age or discharge, whichever is first

Hemoglobin, Biotinidase and GALT are affected by transfusion. If there are no normal results for these three screens prior to transfusion, a repeat is needed 4 months after the last transfusion.

Additional specimens are sometimes needed for the LSD screen as well.

Delays in NBS

Timing is crucial in NBS.

- Specimens need to be collected on time and sent to the lab on time.
- All information on lab slip must be completed.
- Blood spots must be acceptable for testing.

- Repeat specimen can take weeks, putting the newborn at risk.

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Frequently Missing Information

- Birth date and collection date
  - Determines age of infant
  - Determines age of blood
- Gestational age
- Current weight
- TRAB (Test Request Authorized By)
  - Name of provider ordering the test
  - Necessary for lab to release the result

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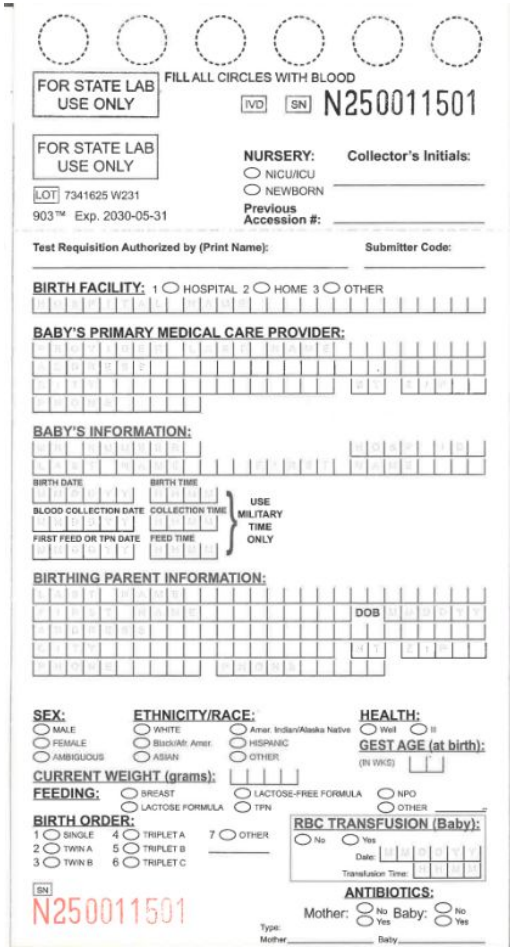
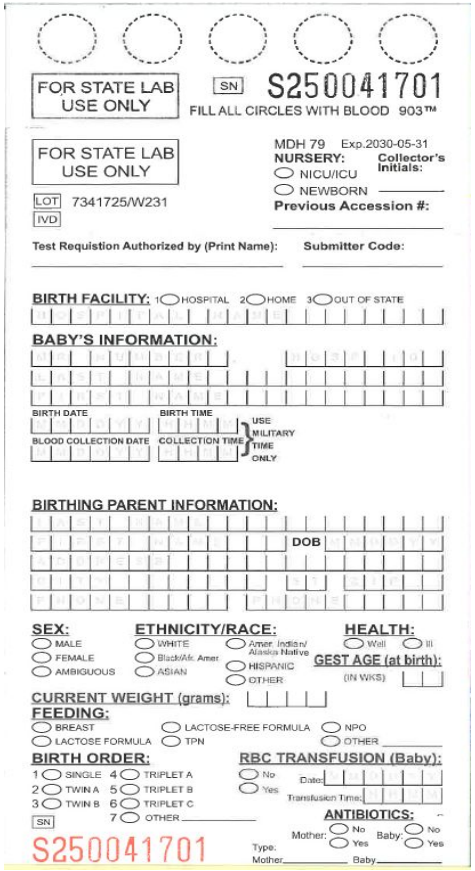
Completion of Collection Form



- Check EXP date. If expired, call 443-681-3900
- Complete all information on card prior to collection of blood
- ***All requested information is important for identification of baby and evaluation of results.***



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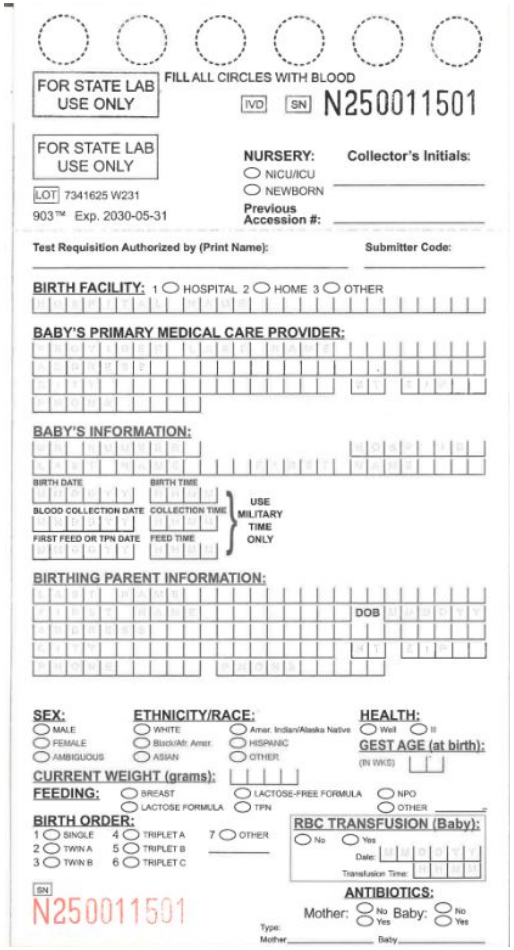
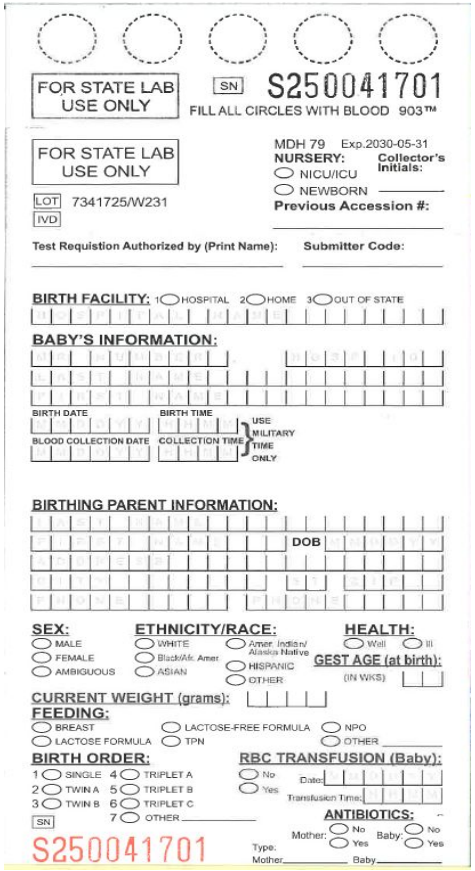


- Accurate information is crucial for testing, as well as linking of initial and repeat specimens.
- Use BLOCK LETTERS
- Enter your submitter code.
- If you do not have one, call 443-681-3900
- ***All requested information is important for identification of baby and evaluation of results.***



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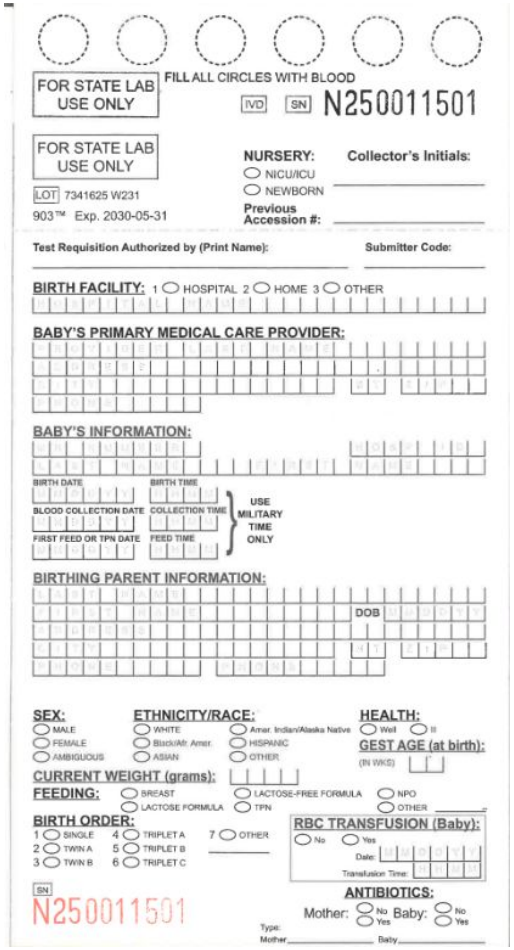
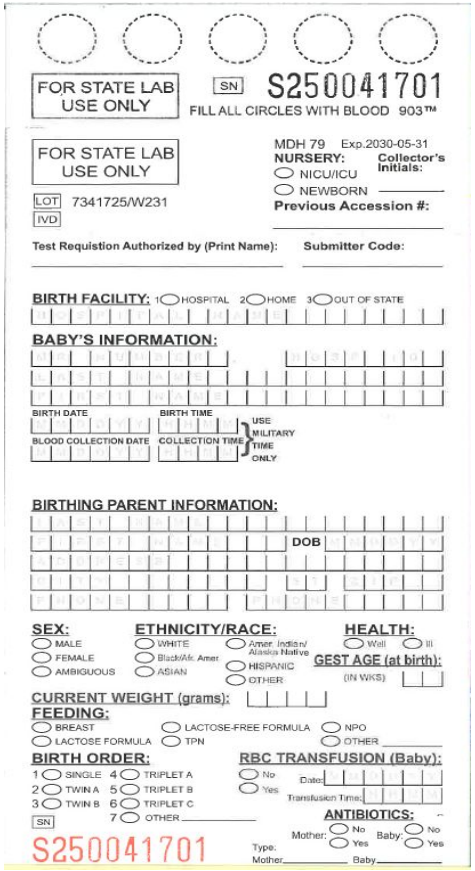


Special circumstances can arise such as adoption, surrogacy or foster care.

- If baby leaves the hospital with caregiver other than the birth mother, please also indicate contact information for caregiver or case worker on the lab slip so baby can be located if there is an abnormal result.
- If baby comes into the office and is adopted or in foster care, please write “adopted” or “foster care” on lab slip. Give adoptive or foster care parent’s contact information and birth mother’s name if known.



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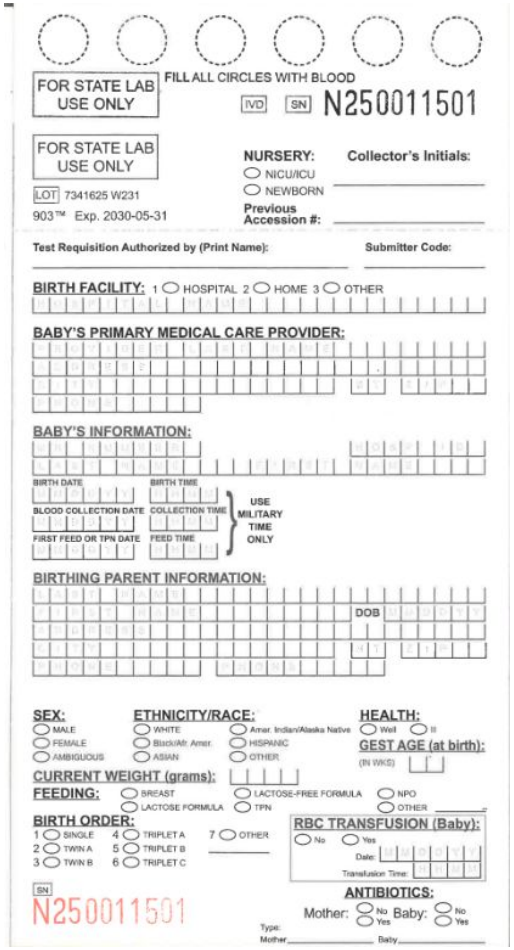
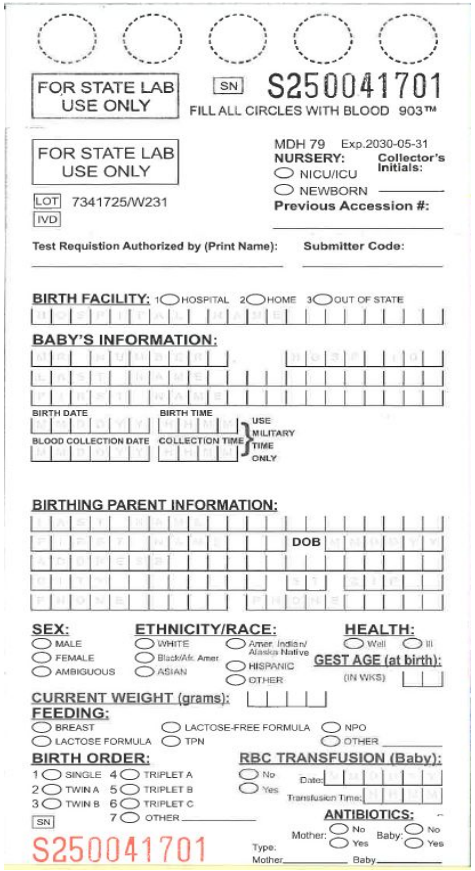


- Type of feeding is vital for interpretation of results – if nursing and being supplemented with formula indicate both breast and type of formula.
- Indicate whether this is a single birth, twins, triplets, etc. Identification of twin A, Twin B, Triplet A, etc., is very important.
- If a nursing mom or the baby were on antibiotics within 48 hours of collection, please note on the lab slip.



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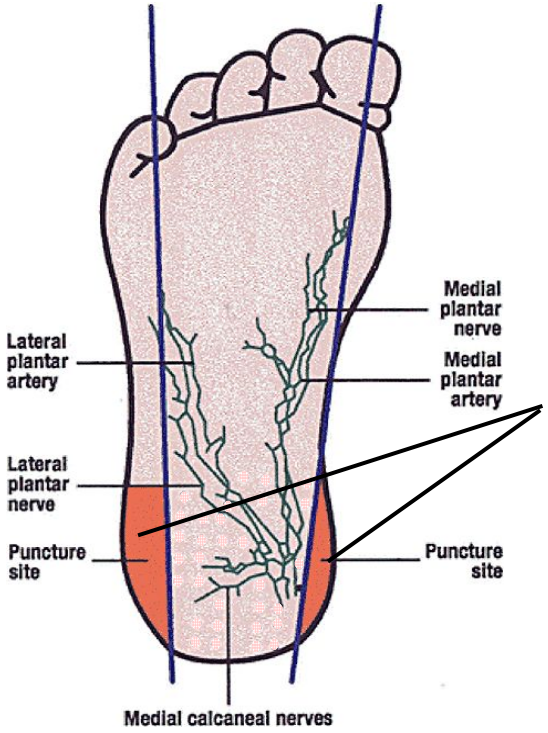
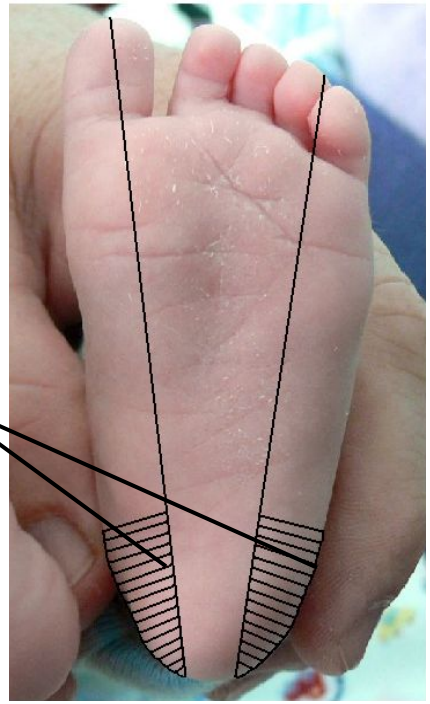
Recommended Sites for Neonatal Capillary Blood Sampling



- Puncture site should be on the medial or lateral portion of the plantar surface of the heel.
- (The plantar surface is the part of the foot that touches the floor if standing or walking.)
- The shaded areas show the best sites for puncture.
- Use of these areas will help prevent possible damage to the heel bone and the nerves and arteries noted on the diagram.



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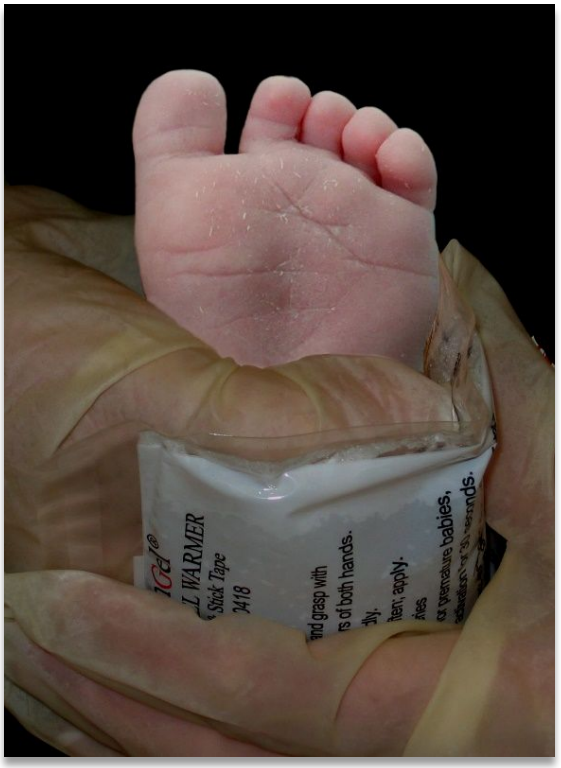
Preparation for Neonatal Capillary Blood Sampling

- Warm infant's heel with soft cloth or diaper, moistened with warm water for 3-5 minutes.
- You can also use a heel warmer, if allowed by your facility.
- Place infant's heel in a dependent position, such as Mom cradling infant with head higher than feet.



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Neonatal Capillary Blood Sampling

- Cleanse site with alcohol prep and allow to dry
- Puncture heel with sterile lancet which has a puncture depth of <2.0 mm.
- The lancet should be labeled for use in newborn capillary specimen collection
- Wipe away first blood drop with sterile gauze pad
- Allow another LARGE blood drop to form and drop on filter paper

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Neonatal Capillary Blood Sampling

- Direct application of blood onto filter paper is recommended.
- Lightly touch filter paper to LARGE blood drop.
- Allow blood to soak through and completely fill circle with SINGLE application. If circle is not completely filled, apply another drop immediately.
- Apply blood to only one side of the filter paper.
- Fill remaining circles by lightly touching one LARGE blood drop to each circle.
- If blood flow diminishes, clean a new site and repeat the process with a new sterile lancet.

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Neonatal Capillary Blood Sampling

Example of an acceptable specimen:
Circles are completely filled and blood is not layered.

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Important Points to Remember

- Don’t touch the actual filter paper portion of the lab slip before, during or after blood collection.
- Check the specimen to make sure the blood is saturated through the card and there is no overlapping of blood in the circles. If there is a problem with the specimen, test should be repeated
- Allow specimen to dry on a clean, flat, non-absorbent surface for 3 hours.
- Send specimen to the Maryland State Laboratory within 24 hours of collection.
- If the hospital or office is contacted by a member of the Newborn Screening Follow-Up team regarding abnormal results, prompt action is needed. The baby has been identified as “at risk” for one of the conditions.

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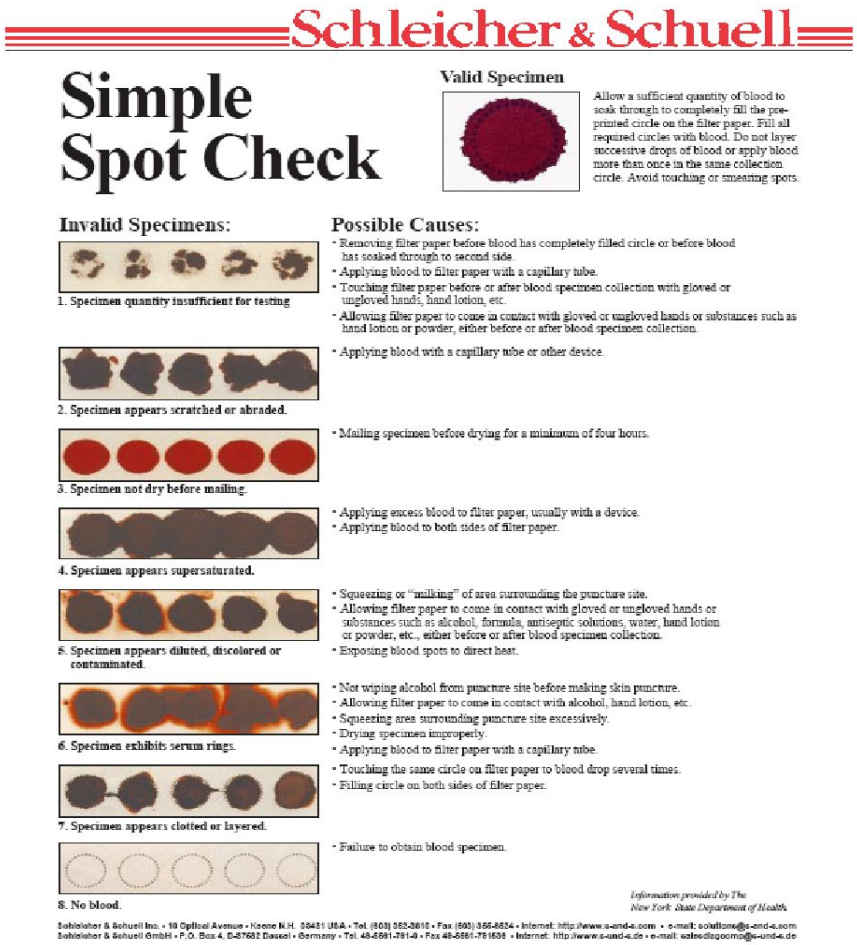
Common Problems with Specimen Collection



Schleicher & Schuell

Simple Spot Check

Valid Specimen

Allow a sufficient quantity of blood to soak through to completely fill the pre-printed circle on the filter paper. Fill all required circles with blood. Do not layer successive drops of blood or apply blood more than once in the same collection circle. Avoid touching or smearing spots.

Invalid Specimens:

Possible Causes:

1. Specimen quantity insufficient for testing
- Removing filter paper before blood has completely filled circle or before blood has soaked through to second side.
- Applying blood to filter paper with a capillary tube.
- Touching filter paper before or after blood specimen collection with gloved or ungloved hands, hand lotion, etc.
- Allowing filter paper to come in contact with gloved or ungloved hands or substances such as hand lotion or powder, either before or after blood specimen collection.

2. Specimen appears scratched or abraded.
- Applying blood with a capillary tube or other device.

3. Specimen not dry before mailing.
- Mailing specimen before drying for a minimum of four hours.

4. Specimen appears supersaturated.
- Applying excess blood to filter paper, usually with a device.
- Applying blood to both sides of filter paper.

5. Specimen appears diluted, discolored or contaminated.
- Squeezing or "milking" of area surrounding the puncture site.
- Allowing filter paper to come in contact with gloved or ungloved hands or substances such as alcohol, formula, antiseptic solutions, water, hand lotion or powder, etc., either before or after blood specimen collection.
- Exposing blood spots to direct heat.

6. Specimen exhibits serum rings.
- Not wiping alcohol from puncture site before making skin puncture.
- Allowing filter paper to come in contact with alcohol, hand lotion, etc.
- Squeezing area surrounding puncture site excessively.
- Drying specimen improperly.
- Applying blood to filter paper with a capillary tube.

7. Specimen appears clotted or layered.
- Touching the same circle on filter paper to blood drop several times.
- Filling circle on both sides of filter paper.

8. No blood.
- Failure to obtain blood specimen.

Information provided by The New York State Department of Health

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Schleicher & Schuell GmbH • P.O. Box 4, D-37582 Dassel • Germany • Tel. 49-5561-791-0 • Fax 49-5561-791538 • Internet: http://www.s-und-s.de • e-mail: salesdugcoms@s-und-s.de

- The most common problem with NBS specimens is **layering of blood on the circles**.
- Another common problem is **not getting enough blood on the circles** or **not letting the blood soak through the filter paper**.
- Scratching of the filter paper occurs frequently when capillector tubes are used and the blood is "colored" on the spots.

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Unacceptable Specimens

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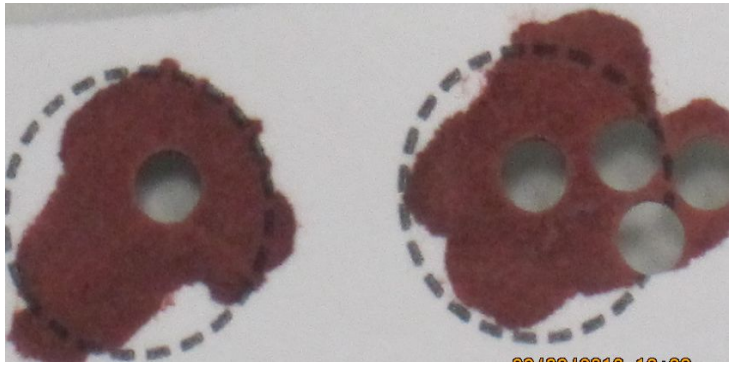
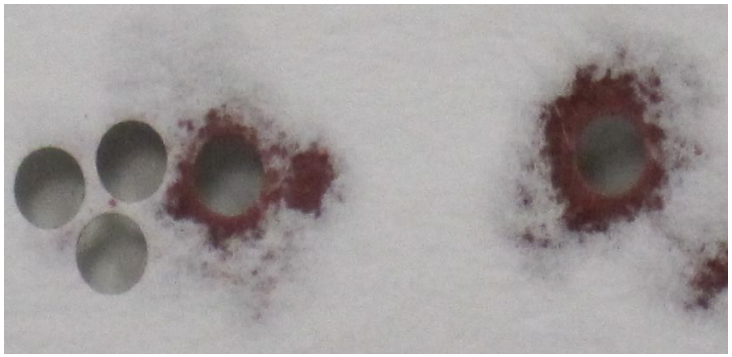
Insufficient Blood to Run All Tests





- From the front of the card, this specimen appears to be satisfactory. However, turning over the same card shows that the blood did not saturate through the filter paper to the back of the card.
- ***If a specimen looks like this, start over with a new card. NEVER apply blood to both sides of the card.***

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Newborn Screening Results

- Results from the first screen are provided to the submitter, which is usually the hospital of birth.
    - The provider office can request these initial results by filling out a request form here.
- If there are abnormal results on the first screen that require immediate follow-up, the NBS Follow-Up team works to identify the baby and primary care provider in order to give results and recommendations to the current provider for the baby.

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Newborn Screening Results

- Results from the second screen are provided to the submitter, usually the provider office, along with results of the first screen.
- If there are abnormal results on the second screen, the provider office will be called.
    - A third screen or confirmatory testing may be requested.
- If results are not available within two weeks of submission, please contact the lab at 443-681-3900 to check on the status of the report.

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Newborn Screening Program Resources and Contact Information

Educational Materials:

- Fill out the request form to receive education materials.

Collaborative Review: (discuss site-specific metrics, including unsatisfactory rates, specimen transit times, and operational processes). Fill out the site visit request form here.

- Contact:
  - LaPortia Barrows
  - Program Manager Newborn Screening Follow-up
  - laportia.barrows@maryland.gov
  - 443-203-9088

Stay Up to Date:

- View our website for the latest newborn screening program information.
  - Newsletters
  - Webinars
  - Family and Provider resources

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Post-Site Visit Survey

Please scan the QR code on the bottom left to visit our website for more information on our program and scan the QR code on the bottom right to take our post-site visit survey.

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