

Sample Hospital Policy and Procedure
Newborn Screening: Blood Spot, Hearing, and Pulse Oximetry
[Tailor to meet your hospital's needs]

Section:

Revision Date:

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Coverage: All Employees

Purpose: Newborn Screening (NBS) is the practice of testing every newborn for harmful or potentially fatal conditions that are not otherwise apparent at birth; including newborn blood spot screening, hearing screening, and pulse oximetry screening for Critical Congenital Heart Disease (CCHD).

Policy

Newborn Screening (NBS) – Blood Spot

Healthy Newborns

1. The newborn blood spot screen will be completed on all newborns ideally at 24 hours plus one minute of age or immediately prior to discharge, whichever comes first. Blood spot specimens will be collected on the NBS filter paper.
2. If the initial specimen for an infant is collected prior to 24 hours of age and before the infant has been discharged, the infant's parents must be notified that a repeat screen at 3-5 days of age is required. They may return to the birthing hospital for recollection of the specimen or they may choose to return to their primary health care provider or a local county health department for collection. Document where the family indicates they will go for collection of the repeat screen.
3. Newborn Screening Brochures can be ordered from the Oklahoma State Department of Health (OSDH) NBS Program by faxing the appropriate Supply Order Form for brochures to 405-271-4892.

NICU/Sick Newborns

1. The premature or sick newborn will have the newborn blood spot screen completed at one of the appropriate times listed below given the newborn's condition:
 - a. Ideally at 24 hours plus one minute of age;
 - b. Prior to red blood cell transfusion if possible; or
 - c. Maximum time is 3-7 days of age.
2. If screened prior to 24 hours of age, a repeat screen is required at 14 days of life. A repeat screen is also recommended at 14 days of age for **all** premature or sick infants.
3. Specimens shall be collected on the NBS filter paper using capillary or venous blood.
4. If the baby is transfused prior to the collection of an initial screen:
 - a. Collect initial screen no later than the 7th day of life.
 - b. Collect TWO Repeat screens:
 - i. 7 days post transfusion (recommended by NBS Program because plasma and/or red blood cells will reflect the infant's own metabolic processes)
 - ii. 90-120 days of life (recommended by NBS Program to evaluate hemoglobin pattern)

Obtaining and Storing NBS Filter Paper Kits

1. NBS Filter Paper Kits may be ordered online or by phone through the Public Health Laboratory. Store the kits at room temperature.
2. Check the expiration date before collecting a specimen.

Tracking NBS blood spot specimens

1. After the specimens are completely dry, ensure they are delivered to the courier pick-up location in time for the next available courier pick-up.
2. Record the filter paper serial # in the appropriate location for ease of tracking.

Ensure that all newborns are screened prior to discharge

1. Personnel will review newborns in their department to ensure that NBS specimens have been collected on all newborns.
2. If the newborn is not screened before discharge:
 - a. Personnel from the unit will notify parents that the newborn needs to return to the birthing hospital to have the NBS collected as soon as possible.
 - b. Notify the NBS Program of the missed screen immediately.

Repeating the NBS if the initial screen is unsatisfactory for testing

1. The NBS Follow-up will notify the primary care provider and parent via letter that the specimen was unsatisfactory for testing. The OSDH laboratory mails all results to the hospital who submitted the specimen and the primary care provider.
2. The responsible hospital department will notify the area that collected the specimen that the specimen was unsatisfactory and request the specimen be recollected if the newborn is still an inpatient. If the newborn has been discharged, personnel from the unit will notify parents that the newborn needs to return to the birthing hospital, their infant's primary care provider, or a local county health department to have the NBS collected within 48 hours.

Obtaining NBS results if the hospital has not received them within 15 days after the date of collection

1. The [insert responsible department] will check the NBS worksheet/log daily for specimen results that have not been received within 15 days of collection.
2. If any outstanding results are noted, the [responsible department] will notify the NBS Program.
3. The results will be obtained from the OSDH and entered into the patient's record.
4. If the OSDH did not receive the specimen, and the newborn is still inpatient/admitted, the department where the newborn is admitted will recollect the specimen. If the newborn has been discharged, personnel from the unit will notify parents that the newborn needs to return to the birthing hospital, their infant's primary care provider, or a local county health department to have the NBS collected as soon as possible, no later than 48 hours.

Newborn Hearing Screening (NHS)**Healthy Newborns**

1. Newborn Hearing Screening (NHS) is to be completed with results recorded and forwarded to the OSDH at the same time as the blood specimen.
2. The NHS will be completed using Automated Auditory Brainstem Response (AABR) technology on all newborns at least 5-6 hours after delivery.
 - c. The initial screen shall be completed prior to 24 hours.
 - b. If a child does not pass (refers) on the hearing screening, a second screening should be completed prior to 48 hours or the pick-up of blood spot filter paper (NBS filter paper - ODH #450).
3. Newborn Hearing Brochures can be ordered from the OSDH NBS Program by faxing the appropriate Supply Order Form for brochures to 405-271-4892.

NICU/Sick Newborns

1. Do **not** delay submitting the NBS blood spot specimen if the hearing screen cannot be performed before the courier arrives to collect the NBS filter paper.
2. If the NHS is not performed before the NBS filter paper is picked up by the courier, appropriately mark the "If not screened, reason:" section of the filter paper.

Ensure that all newborns are screened prior to discharge

1. Personnel will review newborns in their department to ensure that newborn hearing screening has been performed.
2. If the newborn is not screened before discharge:
 - a. Personnel from the unit will notify parents that the newborn needs to return to the birthing hospital to have the screen performed as soon as possible.
 - b. Notify the NBS Program of the missed screen immediately.

Pulse Oximetry Screening for CCHD**Healthy Newborn**

1. The pulse oximetry screen will be completed on all newborns between 24-48 hours of age using an FDA approved pulse oximeter designed for newborns.
2. **Continuous monitoring of oxygen saturation is not an acceptable method for pulse oximetry screening.**
3. The screen is to be performed on the newborn's right hand and either foot with the pulse oximeter's photodetector on the outer aspect of each extremity (under the 4th-5th finger/toe).
4. Newborn Pulse Oximetry Screening Brochures can be ordered from the OSDH NBS Program by faxing the appropriate Supply Order Form for brochures to 405-271-4892.

NICU/Sick Newborn

1. The pulse oximetry screen will be completed on all newborns once they have been weaned from supplemental oxygen and have been on room air for a period of time, as specified by hospital protocol.
2. **Continuous monitoring of oxygen saturation is not an acceptable method for pulse oximetry screening.**
3. The screen is to be performed on the newborn's right hand and either foot with the pulse oximeter's photodetector on the outer aspect of each extremity (under the 4th-5th finger/toe).
4. Pulse oximetry screening does not need to be performed if a newborn has had an echocardiogram (ECHO).

Ensure that all newborns are screened prior to discharge

1. Personnel will review newborns in their department to ensure that CCHD screening has been performed.
2. If the newborn is not screened before discharge:
 - a. Personnel from the unit will notify parents that the newborn needs to return to the birthing hospital to have the screen performed as soon as possible.
 - b. Notify the NBS Program of the missed screen immediately.

Procedure

Orientation of Staff

1. All appropriate staff involved in the newborn screening process will receive education by reviewing the resources available and completing training for NBS blood spot collection, hearing screening, and pulse oximetry screening for CCHD.
2. Staff will receive on-going education regarding the NBS.

Newborn Screening (NBS) – Blood Spot

Refer to the Oklahoma Newborn Screening Regulations. **[Tailor to meet your hospital's needs].**

1. Inform the parents/guardians of the NBS by discussing the process and purpose of newborn screening with them and providing them with the pamphlet “Protect your Baby from Hidden Disease” in English or Spanish, as appropriate. Brochures can be ordered from the OSDH NBS Program by faxing the appropriate Supply Order Form for brochures to 405-271-4892.
2. Enter the lab order for the Newborn Screen and obtain labels.
3. Obtain the NBS filter paper with infant’s name and NHS Result. Check the NBS filter paper to ensure the expiration date has not passed.
4. Prepare the site and collect the blood spot specimen:
 - a. Wash hands vigorously.
 - b. Confirm identity of infant.
 - c. Warm site with commercial heel warmer or warm, moist cloth – not to exceed three minutes.
 - d. Wearing powder-free gloves, cleanse infant’s heel with appropriate antiseptic solution indicated for infant’s gestational age.
 - e. Allow heel to air dry completely.
 - f. To obtain sufficient blood flow, puncture the infant’s heel at the most medial or lateral portion of the planter surface of the heel with a sterile lancet or heel incision device.
 - g. Gently wipe away first blood drop with sterile gauze pad. Allow another LARGE blood drop to form.
 - h. Lightly touch filter paper to LARGE blood drop. Allow blood to soak through and completely fill circle with SINGLE application of blood. (To enhance blood flow, apply GENTLE intermittent pressure to area surrounding puncture site). Apply blood to one side of filter paper only and ensure the blood soaks through the paper to the other side before moving on to the next filter paper circle. Do not contaminate the filter paper by touching the specimen or the pre-printed circles with your fingers.
 - i. Although not the preferred method, applying blood collected in a sterile/clean non-heparinized tube onto the preprinted circles of the filter paper is an acceptable alternative to applying the blood directly from the heel puncture site.
 - i. Fill remaining circles in the same manner. If blood flow is diminished, repeat heel stick. After the specimen is collected, elevate the infant’s foot and, using sterile gauze, briefly apply gentle pressure to the puncture site until the bleeding stops. Do not apply adhesive bandages.
 - j. Blood spots must air-dry horizontally on a nonabsorbent open surface for at least three to four hours at ambient temperature and away from direct sunlight and moving sources of air. Blood spots on the filter paper should not be heated, stacked, or allowed to touch other surfaces during the drying process.
 - i. To assist in the drying process, use the protective cover by simply elevating the filter paper to gently rest on the edge of the protective cover.
 - ii. After drying, the protective cover should be placed over the blood spots to prevent contamination.
 - iii. To avoid cross-contamination, do not allow filter paper blood spots to come into contact with each other.
5. Completed NBS filter paper kits will go to the lab, or courier pick-up location, after drying is

- complete.
6. Ensure all fields on the NBS filter paper are completed.
 - a. Verify the mother's address.
 - b. Verify the infant's planned health care provider.
 - i. Planned healthcare provider must be listed.
 - ii. Failure to list the planned health care provider can delay follow-up and diagnosis of affected infants.
 - iii. Advise parents on the importance of having an accurate planned healthcare provider listed on the NBS filter paper in the event that follow-up is indicated during screening of the blood spots.
 - iv. Instruct the parents to contact the NBS Program at 405-271-6617 if the planned health care provider changes.
 - v. If the provider is out of the area and you do not have an ID number, put the complete name and phone number if possible. If the provider's name is common, include the town where the provider is located.
 - c. The "Submitting Health Provider" section is for the hospital ID. Do not list the hospital in the "Infant's Provider or Physician's Name".
 - d. Complete the Hearing Risk Status section by placing a check mark in the box of all items that applies to the infant. The first question about familial hearing loss is to be asked of the birth mother. Information for the other indicators should be available in the infant's chart.
 - e. Review and distribute the pink (hearing screen) and blue (blood spot screen) education slips attached to the NBS filter paper to the mother/family. Review the process for the parents to obtain results of the NBS. Stress the importance for the parents to obtain screen results.
 - f. Upon discharge, place the completed yellow copy of the NBS filter paper in the newborn's chart.
 7. If a parent/guardian refuses to have the NBS blood spot collected:
 - a. Ensure the parents fill out and sign a Refusal Form;
 - b. Fax a copy of the Refusal Form to the NBS Program at 405-271-4892; and
 - c. Place a copy of the Refusal Form in the newborn's chart/medical record.
 - d. Fill out the demographic section of a NBS filter paper and mark the appropriate "Refused" box before submitting it to the PHL.

Newborn Hearing Screening (NHS)

1. Inform the parents/guardians of the NHS by discussing the process and purpose of the hearing screen with them and providing them with the pamphlet "Oklahoma Newborn Hearing Screening" in English or Spanish, as appropriate. Brochures can be ordered from the OSDH NBS Program by faxing the appropriate Supply Order Form for brochures to 405-271-4892.
2. Conduct the physiologic portion of the hearing screen:
 - a. Ensure the NHS is conducted at least 5-6 hours after delivery, in a quiet environment that is away from other machines.
 - b. Baby needs to be calm and completely dry with no lotions applied to the skin.
 - c. Clean and prepare the skin around the nape/neck, forehead, and shoulder/cheek area where the electrodes will be placed. Clean skin with Nuprep or Alcohol. A small dab of water may be used on the electrodes to assist adherence to the baby's skin. Do not use gel.
 - d. Place the electrodes on the baby's skin:
 - i. Nape/neck = white collar
 - ii. High forehead (vertex) = black top hat
 - iii. Shoulder/cheek (common) = green common
 - e. Connect the machine leads to the electrodes with the snap/alligator clips.
 - f. Place the earphone over each ear.
 - i. Right on Red; "Left over" on blue

3. Record hearing screening results in the “Hearing Screening Results” area on the front page of the filter paper. Place a check mark in the appropriate Pass or Refer box for both the right ear and the left ear.
4. Indicate the method used to screen hearing (ABR, OAE, Other). If “Other” is checked, specify the technology used.
5. If hearing screening cannot be performed, indicate the reason (technical problem, no equipment, caregiver refused, etc.).
6. Complete the Hearing Risk Status section on the filter paper:
 - a. Most of the information can be found in the infant’s chart/medical record. **Note:** Some risk factors must be obtained by asking the family, such as if blood relatives of the infant have a permanent hearing loss that began at birth or in early childhood.
 - b. Mark the all appropriate risk factor(s) that applies to the infant on the filter paper.
7. Detach and give the NHS parent form (pink sheet) to the infant’s parent or guardian at discharge along with the NHS brochure in English/Spanish as appropriate. Explain the results of all screenings and discuss steps for follow-up as needed.
8. Upon discharge, place the completed yellow copy of the NBS filter paper in the newborn’s chart.
9. Special Circumstances:
 - a. If screening will be delayed, follow instructions below.
 - i. For infants placed in special care, be sure to mark “Infant was placed in a Level II or III nursery for more than 24 hours” on the filter paper. Be certain there are no marks in the Screen Method box.
 - b. For infants whose hearing screening cannot be completed by the time the blood specimen is submitted (including those transferred within the facility), and it is anticipated hearing will be screened prior to discharge, do the following:
 - i. On the original filter paper in the “If not screened, reason” area, mark the “Delayed” box.
 - ii. Complete the Hearing Risk Status section. For infants placed in special care, be sure to mark “Infant was placed in a Level II or III nursery for more than 24 hours” on the filter paper. Be certain there are no marks in the Screen Method box.
 - iii. Detach and retain the parent’s copy of the hearing screening form (pink sheet). It will be used to record hearing screening results.
 - iv. Be sure that the infant’s last and first names are legible on the detached document.
 - v. Perform the hearing screening prior to discharge.
 - vi. Record the results as indicated above in the appropriate boxes on the pink parent copy.
 - vii. Mark any appropriate boxes in the Hearing risk status area if this has not already been completed.
 - viii. Photocopy the front of the completed form (pink sheet). Be certain that infant’s name and the filter paper serial number are legible on photocopy.
 - ix. Fax a copy of the photocopy to the NBS Program at 405-271-4892.

Pulse Oximetry Screening for CCHD

1. Inform the parents/guardians of the pulse oximetry screen by discussing it with them and providing them with the pamphlet “Newborn Pulse Oximetry Screening” in English or Spanish, as appropriate. Brochures can be ordered from the OSDH NBS Program by faxing the appropriate Supply Order Form for brochures to 405-271-4892.
2. Wrap the sensor tape around the extremity and ensure the pulse oximeter’s light emitter is directly opposite the photo detector.
3. If using a reusable sensor, secure the sensor using wrap recommended by the vendor. Do not use your hand to secure the sensor site.
4. Use the Oklahoma State Department of Health (OSDH) Pulse Oximetry Algorithm to determine results & record the results of the pulse oximetry screen under the Pulse Oximetry (CCHD)

Screen section of the NBS filter paper.

5. If a newborn has an ECHO, then pulse oximetry screening is not indicated. Ensure that “ECHO” is marked under the Pulse Oximetry (CCHD) Screen section of the NBS filter paper.
6. If a parent or guardian refuses to have the pulse oximetry screen conducted:
 - a. Ensure the parents fill out and sign a Refusal Form;
 - b. Fax a copy of the Refusal Form to the NBS Program at 405-271-4892; and
 - c. Place a copy of the Refusal Form in the newborn’s chart/medical record.
 - d. Fill out the demographic section of the NBS filter paper and mark the appropriate “Refused” box for the pulse oximetry screen before submitting it to the PHL.
7. If a newborn does not have a pulse oximetry screen performed, ensure “Not Performed” is marked under the Pulse Oximetry (CCHD) Screen section of the NBS filter paper. If the pulse oximetry screen is performed at a later time, fill out the Oklahoma NBS Program’s Pulse Oximetry Result Form & fax to the NBS Program at 405-271-4892.

For Information, Call:

1. Oklahoma State Department of Health (OSDH) Newborn Screening Program (NBS)
Follow-up Nurse Phone: 405-271-6617
Follow-up Nurse Fax: 405-271-4892
Lab Phone: 405-271-5070
2. Newborn screening results can be accessed via the web-based system, *Newborn Screening Results (NBSR)*. The requester must use his or her assigned individual login and password and provide specific patient identifiers (filter paper serial #, mother’s/baby’s name, etc..) in order to access the NBS test results. Screening results may be printed from the NBSR website.
 - a. Contact the NBS Laboratory Staff at 405-271-5070 in order to get access to the NBSR.

Resources

1. Oklahoma Newborn Screening 2004 Regulations
2. Oklahoma State Department of Health Newborn Screening Program, Time of Screening & Parent Education Birthing Hospital/Facility Fact Sheet – 2008
3. Newborn Screening Kit
4. Pamphlet – Protect your Baby from Hidden Disease (English P652 and Spanish P652A), ordered from Oklahoma State Department of Health
5. Pamphlet – Newborn Hearing Screen
6. Neonatal Screening Poster (Schliecher & Schuell)
7. Making a Difference Through Newborn Screening: Blood Collection on Filter Paper Summary Sheet, NCCLS
8. Making a Difference Through Newborn Screening: Blood Collection on Filter Paper Video, NCCLS
9. Newborn Screening Program, Instructions for completing Newborn Metabolic Disorder Screening Blood Specimen Form, Hearing Screening Results Section