

## ***BLOOD COLLECTIONS***

### ***I. GENERAL CONSIDERATIONS:***

Proper collection of blood specimens is essential to obtain accurate test results. Blood collections should only be performed by trained personnel.

### ***II. SPECIMEN COLLECTION:***

#### ***A. Blood Collection Preparation:***

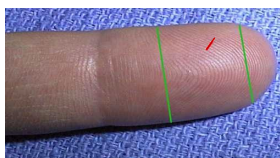
1. Perform hand hygiene.
2. Select appropriate blood collection materials.
3. Identify the correct patient and explain procedure to patient and/or family.
4. Gloves must be worn when performing blood collections.
5. For capillary collections (heel or finger), it may be helpful to pre-warm the puncture site to increase blood flow. The temperature of the warming device cannot exceed 42° C, and should cover the site for no longer than three to five minutes.
6. Cleanse the site with an alcohol swab.
7. Allow the site to air dry for at least thirty (30) seconds prior to performing the puncture.

#### ***B. Blood Collection Procedure:***

##### ***1. Capillary***

##### ***a. Finger puncture***

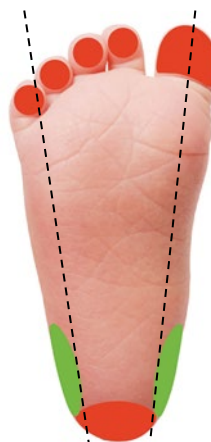
- i. The puncture should be made perpendicular to the fingerprint on the palmer surface of the distal phalanx. The middle or ring finger is generally used. Never perform a finger puncture using the patient's thumb. Avoid the side or tip of the finger.
- ii. Cleanse the site with an alcohol swab. Allow the site to air dry for at least thirty (30) seconds prior to performing the puncture.
- iii. Grasp finger and hold the puncture site downward so blood flows away from gloved hand.
- iv. Perform the finger puncture by holding the safety lancet on the site with firm pressure. Make the puncture in one continuous, deliberate motion in a direction perpendicular to the patient's fingerprint.
- v. Depress the plunger with your index finger to make the puncture.
- vi. Immediately release the plunger while holding the lancet on the site.
- vii. Remove the lancet.



viii. Proceed to step C. below.

b. Heel puncture

The puncture should be made in the medial and lateral areas of the plantar surface of the heel (see the green areas in the picture below). Medial is to the outside of an imaginary line drawn posteriorly from the middle of the great toe to the heel. Lateral is to the outside of an imaginary line drawn posteriorly from between the 4<sup>th</sup> and 5<sup>th</sup> toes to the heel. No other sites on the foot are acceptable for puncture.



- i. Cleanse the site with an alcohol swab. Allow the site to air dry for at least thirty (30) seconds prior to performing the puncture.
- ii. Grasp the infant's heel with the forefinger at the arch of the foot and the thumb placed well below the puncture site at the ankle. Place a finger between the top of the foot and the ankle to prevent an excess of pressure on the heel, which may cause bruising.
- iii. Hold the puncture site downward so blood flows away from the gloved hand.
- iv. Perform the heel puncture by holding the safety lancet on the site with moderate pressure.
- v. Depress the plunger with your index finger to make the puncture.
- vi. Immediately release the plunger while holding the lancet on the site.
- vii. Remove the lancet.



- c. Using a sterile gauze pad, wipe away the first drop of blood to prevent contamination with residual alcohol and the introduction of tissue fluid into the specimen.
- d. Collect the blood in the appropriate microtainer.
  - i. Apply intermittent application and relaxation of pressure, allowing the capillaries to refill and ensure continuous blood flow.
  - ii. Do not massage the finger or heel as this may cause hemolysis.
  - iii. Allow droplets of blood to fall into the microtainer. Do not scrape the tube near the site to get blood droplets.
  - iv. If the blood flow decreases, wipe the area intermittently with a sterile gauze pad to help maintain blood flow.
  - v. If using a microtainer that contains an additive, gently mix the tube several times after 1-3 drops of blood have been added, to allow for complete mixing of the blood with the anticoagulant. After the tube has been filled to an acceptable volume, cap the tube and gently invert the tube 6-8 times to prevent clotting.
  - vi. To decrease the possibility of blood spraying when capping, place a piece of gauze over the cap.
  - vii. Place samples that require refrigeration on ice immediately after collection.
- e. Wipe the puncture site with a sterile, dry gauze pad. Slightly elevate the extremity and apply pressure on the puncture site until the bleeding stops. Apply an adhesive bandage, if applicable.
  - i. Heel puncture: Apply a spot bandage over the puncture site.  
Instruct the parent to remove the bandage within 15 to 30 minutes.
  - ii. Finger puncture:
    - a. Patients 36 months of age or younger: DO NOT apply a bandage, as this presents a choking hazard. Apply direct pressure to the puncture site until bleeding stops. Advise the parent to monitor the puncture site for 15 to 30 minutes.
    - b. Patients older than 36 months of age: Apply an approved bandage over the puncture site when bleeding has stopped. Instruct the patient/parent to leave the adhesive bandage in place for 15 to 30 minutes, and watch the patient closely to ensure the bandage is not swallowed.

- f. Label all specimens at the draw station in the presence of the patient. Ask the patient (depends on age/ability) or parent/guardian to verify every tube is labeled, and the labels have the correct spelling of child's full legal name. Standard labeling requirements include:
  - Full legal patient name
  - Test requisition barcode, medical record number or date of birth (DOB)
  - Date and time of collections (documented on sample or requisition)
  - Tech code of phlebotomist or name of phlebotomist, if not an employee of NCH
- g. Remove gloves and perform hand hygiene.
- h. Order of Collection: Multi-specimen
  - i. Hematology specimens (EDTA-purple top)
  - ii. Blood gas and ionized calcium specimens
  - iii. Other specimens: Chemistry (Heparin-green top), therapeutic drug monitoring (green top with no gel, or purple top, depending on the testing), blood bank (EDTA-purple top), and plain red top (no additive) samples.

## 2. Venipuncture

- a. Identify the site to be used for the venipuncture.
  - i. The larger and fuller median cubital, basilic and cephalic veins at the antecubital fossa at the bend of the elbow are the sites of choice for routine venipuncture.
  - ii. The median cubital vein is the vein of choice because it is anchored better and more easily accessed than the cephalic and basilic veins.
  - iii. Wrist and veins on the back of the hand are also acceptable alternative venipuncture sites. Do not collect from veins on the palmar surface of the wrist and the lateral wrist above the thumb to the mid-forearm.
  - iv. The tip of the finger is used to palpate the vein to determine its size, depth and direction.
  - v. It is recommended to check multiple sites for selection of the best venipuncture site.
  - vi. Avoid burned areas, areas with extensive scarring, areas with open wounds or areas with a hematoma. Do not use the side of a fistula or mastectomy.

Laboratory Services  
Collection Procedures

---

- vii. Avoid I.V. infusion sites. Collect samples from sites on the other arm/hand.
- b. Apply tourniquet and select a vein. Do not leave the tourniquet on longer than one minute. If the tourniquet is left on the patient for greater than one minute, release the tourniquet, wait two minutes, and then reapply.
- c. Cleanse the site with an alcohol swab. Allow the site to air dry for at least thirty (30) seconds prior to performing the puncture. If necessary, dry site with sterile gauze to ensure no residual alcohol remains. Do not touch the collection site once it has been cleaned.
- d. Remove cover from the needle and visually inspect the needle to ensure it has no imperfections or barbs. Do not touch the needle.
- e. Anchor the vein using your non-dominant hand and use the thumb to pull the skin below the venipuncture site taut but not tight.
- f. Insert the needle into the skin with the bevel up, at a 15 to 30 degree angle and with a quick, smooth motion.
- g. Gently draw back on the plunger until the desired amount of blood is obtained in the syringe.
- h. Release the tourniquet once the blood starts to flow freely into the syringe. Do not leave the tourniquet on for more than one (1) minute.
- i. Remove the needle and apply pressure to the venipuncture site with sterile gauze.
- j. Fill the blood collection tubes in the following order:
  - i. Blood culture bottles (IMPORTANT! Blood culture requires special collection instructions; see separate procedure)
  - ii. Coagulation tube (blue top)
  - iii. Plain tube, non-additive with or without gel (red top)
  - iv. Heparin tube with or without gel (green top)
  - v. Quantiferon TB-Gold Plus tubes (ensure all tubes in the set are filled to the appropriate volume; see Nationwide Children's Lab Test Directory for more information)
  - vi. EDTA tube (purple top)
  - vii. Glycolytic inhibitor oxalate/fluoride (gray top)
- k. Do not remove rubber stoppers from evacuated tubes to transfer blood.
- l. Use a safety syringe shielded transfer device to transfer the blood from the syringe to an evacuated tube.
- m. The stopper is pierced with the needle and the tube is allowed to fill without applying any pressure to the plunger.
- n. After the tube has filled, gently invert any tubes that contain anticoagulant 6-8 times to prevent clotting.

Laboratory Services  
Collection Procedures

---

- o. Continue to apply pressure to the site until the bleeding stops. Apply an adhesive bandage. Instruct the patient/parent to leave the adhesive bandage in place for a minimum of fifteen (15) minutes, and to watch the child closely to ensure the bandage is not swallowed. Note: Bandages on infants should be removed within 15 to 30 minutes.
- p. Label all specimens at draw station in the presence of the patient. Ask the patient (depends on age/ability) or parent/guardian to verify every tube is labeled, and the labels have the correct spelling of child's full legal name. Standard labeling requirements include:
  - i. Full legal patient name
  - ii. Test requisition barcode, medical record number or DOB
  - iii. Date and time of collections (documented on sample or requisition)
  - iv. Tech code of phlebotomist or name of phlebotomist if not an employee of NCH
- q. Remove gloves and perform hand hygiene.