

COLLECTION OF BLOOD

Capillary Sampling The specimen of choice for laboratory analysis is generally a venous specimen. For blood gas analysis, the specimen of choice originates from an arterial draw. When selecting an alternate site for blood collection, one should consider the age and size of the patient. One should also consider which method, either capillary or venous, would result in the most satisfactory specimen with the least amount of discomfort for the patient. As with any procedure in which there is potential exposure to infectious agents, standard precautions are observed when collecting blood by capillary sampling.

Types of patients

1. Newborn infant to age 0 or 3 months (depending on the size of the foot) - The heel or toe is generally used because these sites are more accessible than the finger. Any child old enough to walk is too old for a heel or toe stick.
2. Young Children - The third or fourth finger is usually punctured, although any finger is acceptable. **Be sure to explain to the child what is going to be done. DO NOT tell the child that this procedure will not hurt - his confidence will be lost, and the procedure will be much more difficult.
3. Adults - The third or fourth finger is generally used to obtain the specimen, although any finger is acceptable.

Equipment Used for capillary sampling

1. Gloves (and other protective wear as necessary)
2. Alcohol swab
3. Dry gauze pads
4. Sterile blood lancet devices
5. Appropriate micro-collection tubes (microvettes) if testing is not immediate

Procedure

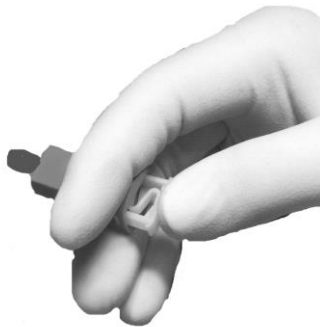
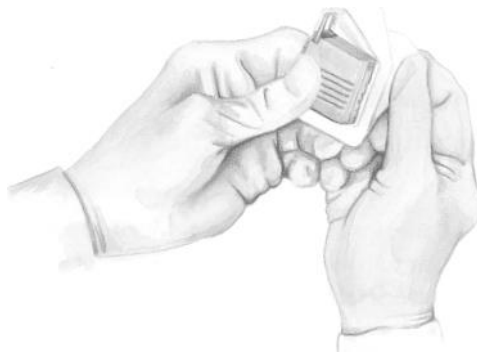
**Identification of the patient is extremely important - check the armband for the patient's name and medical record number. If the patient is awake and alert, ask him for his name and date of birth. For outpatients, please ask for his name and date of birth, and have the patient verify the information on the specimen label.

1. Select the appropriate finger, toe or heel. Cleanse with an alcohol pad and allow the site to dry.
2. With a sterile lancet device, make a deliberate deep puncture on the side of the fingertip, heel, or toe. (A deep puncture is not more painful than a superficial one and will produce a better flow of blood, making it unnecessary to repeat the procedure.)

3. Use dry gauze to wipe away the first drop of blood.
4. Apply moderate milking motion pressure about 1 cm. below the puncture to obtain a drop of blood.
5. Release the pressure for a second or two to allow the blood to recirculate. Repeat the milking motion pressure, blood collection, and release technique until the desired amount of blood is obtained.
6. Apply a bandage to the wound.

Selection of Lancet Device

For collection of blood by heel stick one should use the Tenderfoot® Device

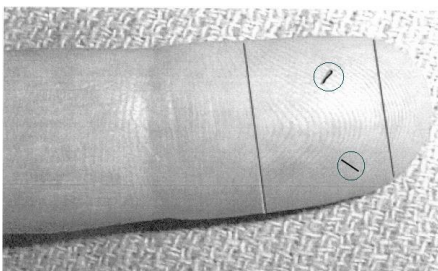


BD Contact Activated Lancets are available for fingersticks. The blue device has a depth of 2.0mm, and is suitable for fingersticks on most children.

Inpatient units: ACCU-CHECK® Safe-T-Pro Plus are available as a single use lancet device. It has three depth settings- 1.3, 1.8, and 2.3mm- for varying patient conditions, such as poor circulation or calloused fingers. Healthcare professionals have the flexibility at the bedside to choose the optimal depth based on the patient condition and blood volume required.

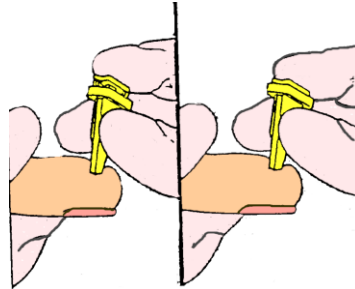
FINGER STICKS

The best fingers to use for finger sticks are the middle and ring fingers. The incision should be made off to the side of the finger and perpendicular to the fingerprint lines. (Figure 3).



The proper location on the 3rd or 4th finger of the non-dominant hand for performing a fingerstick is outlined here between the lines. The puncture should be made just off center and perpendicular to the fingerprint ridges

Press the lancet device firmly against the finger and press the trigger of the purple ACCU-CHEK lancet, or the blue lancet will activate automatically with applied pressure.



Discussion

Use a gentle "milking motion and not squeezing the finger tightly will keep the specimen from becoming hemolyzed, or diluted with tissue fluid. Results of the hematocrit, red cell count, and hemoglobin are lower in the peripheral blood than those results in venous blood. If a patient's finger or toes are cold, it is suggested that the extremity be warmed before the puncture is made. This will result in a better blood flow and a more accurate analysis.

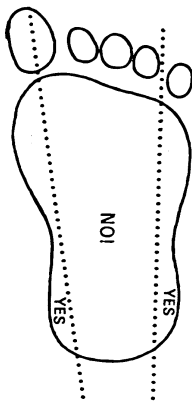
Capillary Blood Collection Tubes

Microvette collection tubes are available with or without anticoagulant for capillary blood collection. With the bevel facing up, allow the blood droplet to enter the capillary tip and drip into the sample container.

HEEL STICKS

Heel sticks may be done on infants less than 2-months of age, depending on the size of the heel. The site should be on the plantar (bottom) surface, medial to a line drawn posteriorly from the middle of the great toe to the heel, or lateral to a line drawn posteriorly from the fourth and fifth toes to the heel. (See figure 8). Skin punctures should not be performed in the area of the arch as this could result in injury to nerves, tendon, and cartilage, or in the back, center heel area as this could result in osteomyelitis or tendon injury.

Excessive pressure when squeezing the heel may cause bruising or hemolysis of the specimen.



BE KIND TO TINY FEET!

Use the most medial or lateral portions of the plantar surface of the heel.

Do not use the posterior curvature of the heel

Puncture should be no deeper than 2.4 mm.

Do not use previous puncture sites.

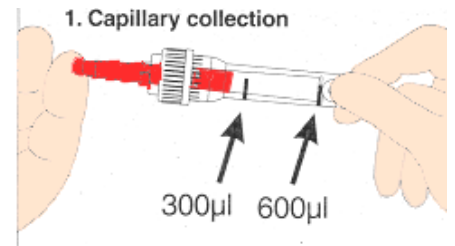
TOE STICKS

The toe is very seldom used for capillary draws. The only toe to be used is the Great Toe/Big Toe.

The best area for a toe puncture is toward the center where the tissue is not as thick. Apply the lancet to the toe and press the plunger, making the incision.

Filling Capillary Blood Collection Tubes

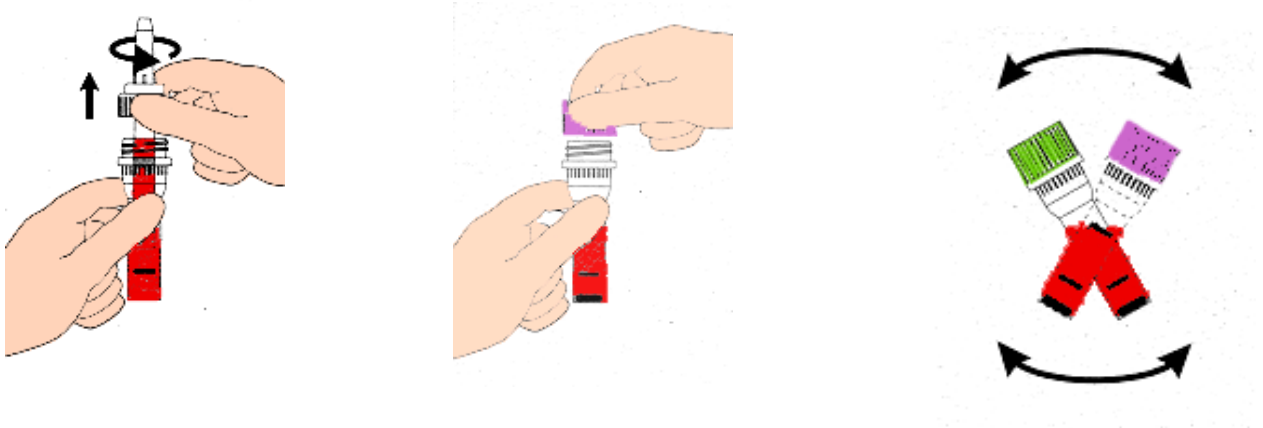
Microvette collection tubes are available with or without anticoagulant for capillary blood collection. **The anticoagulant is actually contained in the inner collection straw, so it is imperative to allow the blood to flow through the straw into the container.**



Keeping the collection device horizontal, allow the blood droplet to enter the capillary tip and fill the inner straw. For best results, do not allow air to be introduced into the inner collection straw. Once the inner straw is full, lower the distal end of the tube slightly to allow the blood to flow from the straw into the container. If more than 600µl are required, you may continue to collect blood into the inner straw.

When an adequate amount of blood has been obtained, remove the collection straw and discard.

Cap the sample container and mix the blood with anticoagulant by inverting the tube several times. If more than one sample container is collected, make sure that the correct color cap is screwed onto each container. **Match the color of the cap with the color of the script on the container.**



Order of Draw for Skin Puncture

Blood gases
Lavender Microvette
Green Microvette
Red Microvette

Tips for Drawing Capillary Blood Gases

1. Warm hand or foot for 2-3 minutes prior to drawing. This makes the capillary blood closer to arterial than venous. Use warm water from the tap. **DO NOT** heat water in a microwave.
2. Keep thumb and finger directly across from each other when holding the blood gas tube. This will minimize the chance of the tube breaking.
3. Fill the tube as full as possible with **NO** air bubbles
4. Keep tubes horizontal at all times. This helps to minimize spillage and collect a good specimen without bubbles
5. Roll the tube between the fingers to mix the blood with the anticoagulant. Do this while waiting for the finger capillaries to refill for the next drop.
6. When capping tubes, again remember to keep the thumb and finger across from each other and close to the end that you are capping.
7. Try putting the label on the tube so that there is no sticky area exposed.
8. ***Do not transfer blood from blood gas collection tubes to other types of collection tubes.***



STANDARD PRECAUTIONS

All standard precautions are to be followed. Gloves are to be worn at all times during a blood draw. Hands are to be washed between each patient.
Inpatient units: Remember to **WASH IN** and **WASH OUT**.

SHARPS/BIOHAZARD MATERIAL

1. All poking devices (Tenderfeet, lancets, syringe needles) are to be disposed of in the sharps containers. For the safety of the lab staff, remove the needle from the syringe before delivering blood gas syringes for analysis.
2. Gloves, gauze and other trash can be disposed of in the regular trash.