



Dayton Children's Hospital  
One Children's Plaza Dayton, Ohio 45404

Laboratory Services  
**Specimen Collection Manual**

**CAPILLARY PUNCTURE PROCEDURE**

**I. PURPOSE:**

These guidelines provide the appropriate steps and techniques to perform successful and safe capillary punctures.

**II. PROCEDURE:**

1. Assess the patient and determine whether a finger or a heel would be most appropriate for use. This will be determined by:
  - a. The age of patient
  - b. The patient's size
  - c. Availability of sites
  - d. Tests ordered and the amount of blood required to perform those tests
  - It is recommended by The Clinical and Laboratory Standards Institute that fingers of infants less than 1 year of age should **NOT** be used for a capillary puncture. However, given the size of the child this may not always be the case.
  - Toes of any infant should **NOT** be used for capillary punctures to avoid the risk of puncturing the bone. For the same reason, the toes of children should not be utilized.
  - Heels are preferred for capillary puncture in infants less than 1 year of age. The puncture is performed on the lateral side of the heel. (See attached illustration) Avoid swollen, calloused and heels with scars and lesions.
2. **It is strongly recommended** that an infant heel warmer be applied to the site for five 2-5 minutes prior to the puncture. A heel warmer **MUST** be used when electrolytes or blood gases are being drawn. Using a heel warmer increases circulation 7 times.
3. Choose a site that has not been punctured too many times. If it has, choose another site if possible.
  - Using swollen or previously punctured sites may contaminate the specimen because of accumulated tissue fluid.
4. After assessing the patient, the phlebotomist will determine the correct safety lancet to use. This will depend on several things: the age of the patient, the size of the patient, availability of sites, the tests that are ordered and the amount of blood required to perform the tests.
  - For heel puncture devices, lancets are single-use with retractable blades.
  - Lancing devices for finger punctures must be auto-disabling single-use devices (approved by CVAC) with retractable blades that are only used once on a patient and then disposed.
  - The following guidelines should be followed when performing heel punctures:



1. A Premie Tenderfoot lancet (purple = 0.85 mm depth) should be used for pre-term Infants < 1.5 kg or 3 lb. 5 oz.
2. A Tenderfoot lancet (green = 1 mm depth) should be used on term infants



> 1.5 kg or 3 lb. 5 oz

- The following guidelines should be followed when performing fingersticks:
  1. A lancet with a puncture depth of less than 2.0mm should be used for finger sticks on children greater than 1 year of age.
  2. The middle or ring finger is the preferred digits for finger sticks. The skin puncture is obtained from the palmar surface of the finger's distal phalanx. (See attached illustration)
- 5. Cleanse the site using 70% isopropanol alcohol. If drawing a blood gas, use betadine to cleanse the site.
- 1. Perform the puncture on the most medial or most lateral portion of the plantar surface of the heel. (See attached illustration)
- 2. Wipe away the first drop of blood. (The first drop may contain alcohol that could affect test results.)
- 3. If drawing a blood gas, collect this first. (See Capillary Blood Gas Procedure) To insure accurate results, this should be a free flowing sample and there should be no air bubbles in specimen. Label specimen. Give specimen to the nursing staff or respiratory therapist for immediate analysis.
- 4. After the site is punctured and the first drop of blood is wiped away, a second drop of blood will form over the puncture site. When the tip of the collection tube touches this drop, blood will flow into the tube by capillary action into the bottom of the tube. The blood will follow the same track as the first drop. Blood flow from the puncture is enhanced by holding the puncture site downward, below the heart and gently applying intermittent pressure to the surrounding tissue (or proximal to the puncture site when the blood is obtained from a finger.)
- 5. Excessive squeezing, "milking" or "scooping" the blood from the skin into the collection tube should be avoided.
  - Strong repetitive pressure "milking" must be avoided, as both may result in hemolysis or tissue-fluid contamination of the specimen.
- 11. When the necessary amount of blood is obtained, clean gauze is used to apply gentle pressure on the puncture site.
- 6. Bandage site with appropriate size band aid (See Band-Aid policy)
  - Band aids should not be applied to pre-term infants in the NICU. Unwrap a piece of gauze and wrap around infant's foot and secure gauze to itself with a small band-aid.
- 13. Label tubes of blood at the bedside.

#### **PROBLEMS AND SOLUTIONS FOR CAPILLARY PUNCTURES:**

7. Clotted, Quantity Not Sufficient (QNS) and hemolyzed specimens are the most common problems that occur with capillary punctures. In order to prevent clotted or short samples, it is imperative that the specimen is obtained as quickly as possible before the clotting process begins. Warming the site will also help the blood flow more freely.
8. Hemolysis (the destruction of red blood cells which can adversely affect test results) of a capillary specimen is caused by excessive squeezing or by scraping the blood from the surface of skin with the collection container. Several things can be done to prevent this. Warming the site will increase the



blood flow, making it easier to collect the specimen. As the specimen is being collected, be sure the blood is not running or smearing on the skin surface. Large round drops of blood provide easier collection.



3. Capillary punctures performed in the center of the heel could penetrate the bone possibly causing bone spurs or osteomyelitis.



**NOTE:** All blood specimens, capillary and venous, collected in tubes containing anticoagulants should be inverted gently 8-10 times and not vigorously shaken.