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| MID-COLUMBIA MEDICAL CENTER  1700 East 19th Street  The Dalles, OR 97058 | |  | SCOPE:  Laboratory - Phlebotomy |
| SUBJECT/TITLE: Capillary Blood Specimen Collection | | | |
| DEPARTMENT: Laboratory | OWNER: Technical Supervisor | | |

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**Purpose Statement:**

Capillary Blood Specimen Collection policy provides a facility standard for MCMC health care professionals to obtain skin puncture fingerstick or heel incision capillary blood specimens for diagnostic and point-of-care laboratory testing.

Skin puncture capillary blood is the preferred method of blood specimen collection for newborns and infants less than one year of age. Capillary blood collection may be used for adults and older children under certain circumstances where venipuncture is difficult, or where capillary blood specimen is an appropriate or acceptable blood specimen for the testing performed.

**Definitions:**

* Additive- ingredient placed in a collection container to prevent the blood from clotting
* Capillary blood- blood obtained by skin puncture or incision which contains a mixture of undetermined proportions of blood from arterioles, venules and interstitial and intracellular fluids.
* Capillary puncture device- a sterile single-use device that punctures or cuts the skin with a sharp pointed or bladed instrument then automatically retracts into a protective housing.
  + Incision- a cut into the skin using a blade
  + Puncture- breakage of skin with a sharp-pointed instrument
* Microcollection tube- a small-volume container used to collect capillary blood specimens
* EDTA- ethylenediaminetetraacetic acid additive most commonly used for whole blood hematology samples
* CRT -Capillary refill time (CRT) is a measure of time it takes for a distal capillary bed such as those found in fingers to regain color after pressure has been applied to cause blanching. Normal CRT is less than 2 seconds.

**Equipment:**

All specimens, controls, and reagents must be treated as a potential biohazard and thus be handled using Standard Precautions.

**Reagents and Materials:**

1. Disposable Gloves
2. 70% isopropyl alcohol pads
3. Sterile 2x2 gauze pads
4. Latex free bandage (optional)
5. Fingerstick Capillary puncture self-retracting devices:
   * 1. Accu-Chek Safe-T-Pro Plus™ variable depth 23g retractable needle, adjustable to 1.3mm, 1.8mm or 2.3mm depth
     2. Accu-Chek Safe-T-Pro Uno™ or other equivalent Lancing Device 28g retractable needle, 1.5mm depth
6. Heel incision self-retracting device:
   * 1. Tenderfoot Newborn™ - 1.0 mm Depth x 2.5 mm Length, use for birth to 6 months 2500g–9kg



1. Single use commercial warming device: use according to manufacturer’s instructions
2. Microcollection tubes or devices: filled to the recommended volumes
   1. CBG (refer to Capillary Blood Gas policy for collection and mixing details)
   2. K²EDTA (lavender cap)
   3. Lithium Heparin with gel, (green cap) includes a capillary straw to pull specimen into the device
3. Sharps container

**Procedure:**

1. Review Laboratory Test Order. Resolve discrepancies or clarifications before proceeding.
2. Identify Patient per MCMC Identification of Patient policy. Note: Inpatients must have ID bands.
3. Assess Patient for procedure restrictions. see [Limitations](#Procedure_Lim)
4. Provide patient or guardian information regarding specimen collection and purpose. Obtain informed consent before proceeding.
5. Gather appropriate supplies (puncture/incision device, gloves, gauze, alcohol, bandages, microcollection tubes)
   1. Puncture/Incision devices:
      1. Pediatric Patients: refer to age and weight considerations for puncture device selection per [Reagents and Materials](#Equipment_RM)
         1. Heelstick or Incision – *Note: Fingerstick capillary puncture devices must not be used to perform heelstick collections.*
            1. Tenderfoot Newborn - birth to 6 months 2500g–9kg
            2. Tenderfoot - 6 to 12 months weighing less than 10kg (approximately 22 lbs). *Maximum incision depth 2.0mm.*
         2. Fingerstick puncture – do not perform fingerstick on newborn or infant less than one year old.
            1. Fingerstick or Great Toe- patients six to twelve months weighing more than 10kg or approximately 22 lbs., puncture depth not to exceed 1.5mm.
            2. Fingerstick- children under the eight years of age puncture depth not to exceed 1.5mm.
      2. Adult Patient Fingerstick puncture 1.5mm or 1.8mm depth
   2. Microcollection tube etc. per Lab analysis specimen type, listed per order of collection for a single capillary puncture.
      1. Capillary blood Gas (see Capillary Blood Gas policy for details)
      2. EDTA
      3. Lithium Heparin
      4. Filter paper for newborn screen
6. Wash hands and apply Gloves.
7. Position patient to stimulate blood flow to the extremity.
   1. Pediatric heelstick or Great Toe puncture- position foot slightly lower that the rest of the body, if possible.
   2. Fingerstick collection- patient’s arm should be positioned slanting downward on a suitable support.
8. Select appropriate/acceptable puncture site per gridded areas.
   1. Fingerstick- palmar surface of the distal segment of the middle or ring finger (green shaded area).

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* 1. Heelstick – posterior curvature of the heel (green shaded area)

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1. Warm Puncture site. Do not warm skin to greater than 42 °C.
   1. Finger warming techniques:
      1. Massaging the hand and fingers
      2. Encourage the patient to run hands under warm water
      3. Place hand in a warming blanket for three to five minutes.
   2. Newborn Heel warming:
      1. Use Commercial warming device, apply for three to five minutes.
2. Cleansed site with 70% isopropyl alcohol pad and allowed to completely air dry.
3. Remove lancet from packaging. Select appropriate depth of a multiple depth lancing device. 
4. Twist protective cap or shield to remove.
5. Hold lancet or incision device firmly between fingers.
6. Secure finger or heel to prevent sudden movement.
7. Notify patient of imminent puncture, (with exception of an infant).
8. Hold the lancing or incision device firmly against the side of the fingertip or heel. Align incision device across or perpendicular to heel prints.
9. Activate the puncture device per manufacturer's instruction.
10. Wipe away the first drop of blood with sterile gauze. *NOTE any manufacturer’s instructions regarding the elimination of the first drop of blood should be followed for point-of-care testing devices*. i.e. POC INR requires use of first drop of blood for testing.
11. Allow another drop of blood to form. *Do Not excessively squeeze or apply sustained pressure which can cause hemolysis and/or contaminate the specimen with tissue fluid potentially altering lab test results.*
12. Touch the point-of-care test strip or microcollection device to the formed capillary blood drop without touching the patient’s skin.
    1. Hold microcollection tube angled slightly upward for blood to flow into tube without air bubbles.
    2. Cap and periodically mix microcollection tubes with additives during collection to avoid clotting.
    3. Fill microcollection tube to fill line, cap the tube and mix additive tubes again by gentle inversions 10x. Overfilling or Underfilling can cause clot formation and/or inaccurate results.
13. With sterile gauze, apply pressure to the collection site and slightly elevate the extremity until bleeding has stopped. Apply optional bandage.
14. Immediately label any microcollection specimen containers in presence of patient.
15. Complete collection information on the label or forms, to include the date and time of collection and initials of collector.
16. Discarded Puncture/incision device into a Sharps container.
17. Remove gloves and wash hands
18. Document collection information in Patient LIS for collections not electronically recorded by point-of-care testing methods.

**Specimen Collection:**

Special specimen collection requirements:

1. Bilirubin samples collected in Lithium Heparin microcollection tube must be protected from light during and after collection.
2. Newborn screening filter paper collections must have capillary blood applied to one side of the paper only and have sufficient quantity to soak completely through the paper and fill the preprinted circles.
3. If the capillary return time(CRT) before performing a fingerstick collection is >3 seconds capillary blood specimens should not be used for point-of-care testing.
4. EDTA whole blood collections must be mixed thoroughly during and after collection to prevent clotting.

**Unacceptable Specimen:**

Specimens are ineligible for testing and are to be rejected if they meet any of the criteria described below:

1. Specimen is not properly labeled with two unique patient identifiers - such as name, date of birth, medical record number, etc...
2. Specimen volume is insufficient for analysis.
3. Specimen collection in a microcollection tube not filled to the recommended volume.
4. Specimen not collected in microcollection tube with acceptable additive for testing.
5. Specimen not collected in correct collection order for microcollection tubes.
6. Specimen not collected quickly, resulting in capillary whole blood specimen with EDTA additive which has clotted.

**Limitations:**

1. Circumstances when capillary puncture is not appropriate include:
   1. Infection
   2. Calcification of puncture site
   3. Scarring
   4. Hematoma
   5. Bruising
   6. Other test specific limitations i.e., blood glucose testing on critically ill patients.

**Contact Information:**

The following organizations may be contacted concerning instrument/device performance:

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| **Contact information by organization** | | | |
| **Organization** | **Instrument/Device** | **Phone Number** | **Fax** |
| Laboratory | Capillary puncture devices | 541-296-7225 |  |

**References:**

1. Collection of Capillary Blood Specimens GP42 7th ed. Wayne, PA: Clinical and Laboratory Standards Institute, 2020.
2. Procedures and Devices for the Collection of Diagnostic Capillary Blood Specimens; Approved Standard-Sixth Edition. H04-A6. Wayne, PA: Clinical and Laboratory Standards Institute, 2008.
3. Lab Notes: BD Diagnostics-Preanalytical Systems, Volume 20, No 1, 2009

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| **Review/Revision Date** | **Type** | **Description of Change** |
| 11/04/2021 | Revision | Procedure rewritten |
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