Venipuncture Procedure

Personal Protective Equipment

- **Gloves**: Gloves are an additional measure to be used along with hand washing. As all gloves have minute holes in them that may permit microorganisms to enter, the idea of peeling off gloves is not a substitute for hand washing. Use 1 pair of gloves per procedure. Always wear gloves when performing venipuncture. Multiple layers of gloves are unnecessary and may deter from tactile sensation while promoting breaks in technique. Organisms have a greater tendency to adhere to latex and vinyl than to human skin. Always remove gloves when going from dirty to clean areas. Never wash your hands while wearing gloves. Do not go from patient to patient wearing same pair of gloves. Alcohol based hand wash solutions can be used in place of soap and water.

- **Gowns**: Gowns are worn if there is a potential for gross contamination of clothing with body fluids and during some isolation situations.

- **Masks**: The use of masks is to prevent contact transmission of blood and body fluids to your mouth and nose, if procedure involves potential aerosolization or splashing of body fluids. They are worn on nursing units in cases of reverse isolation or respiratory isolation. Patients' rooms will be clearly identified in these cases. Discard mask after each instance.

- **Goggles/Face Shields/Safety Glasses**: The use of goggles, face shields, and glasses is to prevent contact transmission of blood and body fluids to your eyes, if procedure involves potential aerosolization or splashing of body fluids. When soiled, use soap and water to clean them, while wearing gloves.

Cleaning Spills

To clean the environment exposed to blood/body fluids:

- Put on gloves.
- Remove broken glass by using 2 pieces of cardboard or similar rigid material. Place in a SHARPS® container. Never pick up glass with your hands.
- Cover area of spill with paper or cloth towels.
- Pour (do not spray) a suitable germicide over the spill and allow to remain in contact for at least 10 minutes. A 1:10 dilution of freshly mixed bleach and water is recommended.
- Clean area of spill and deposit towels into appropriate container for disposal.
- Remove gloves, and wash hands thoroughly. Sanitizing gel is also acceptable.

Routine Collections

- **Equipment**:
  - Tourniquet
  - Needles 21 to 23 gauge/safety device
  - Collection tubes & holder
  - Cotton
  - 70% alcohol, ChloraPrep® or Betadine®/soap depending on test to be drawn
  - Laboratory computer labels/handwritten label
  - Gloves

- **Identify Patient**: Identification of patient is crucial to ensure that blood specimen is being drawn from individual designated by physician.
  - Outpatients or inpatients should be asked to state/spell their full legal name, state their date of birth.
  - Inpatient armband must match request, word for word, letter for letter, and number for number.
  - Unconscious emergency patient must be provided with a temporary identification of some kind. Temporary armbands are encouraged whenever patient is not able to offer identification. It remains on patient even after formal identification is made.
  - If armband is wrong or missing, Nursing will be requested to provide an accurate armband. If patient is not properly identified, do not draw blood.

- **Needles/Collection Tubes and Order of Draw**:
  - Open needle cartridge and screw securely into needle holder. Check for burrs or hooks on needle prior to venipuncture.
  - Select appropriate collection tubes for tests ordered. Plan appropriate order of draw for collection tubes. Draw in the following order only:
  - Incorrect order of draw may affect test results.

  1. Blood culture (BacT/ALERT® blood culture vials)
  2. Sodium citrate plasma (blue-top)
  3. Red plain non-gel (red-top)
  4. Serum gel separator (gold/SST®)
  5. Lithium heparin (green)
  6. EDTA (Lavender-top)
  7. Potassium oxalate/sodium fluoride (grey-top)
• Apply tourniquet. Apply tourniquet 2 to 4 inches above venipuncture site to increase venous filling, which makes veins more prominent and easier to enter. Never leave tourniquet on longer than 1 to 2 minutes. To do so may result in hemoconcentration, increased hemolysis, and variations in blood values. Tourniquet should be applied as a constricting band, not so tight as to cut off circulation. It should not hurt.

• Ask patient to “make a fist” so that veins become more prominent and easier to find. Vigorous pumping should be avoided as it could alter test results.

• Site selection is important. The larger of the medial cubital and the cephalic veins are most often used. Hand and wrist draws are acceptable as a last resort.

• Palpate and trace path of veins several times with index finger to check direction vein is running. Veins should be soft and spongy. If hard and cord like, do not use. Superficial veins are not readily apparent, blood can be forced into vein by gently massaging of arm from wrist to elbow.

• If nothing is apparent on 1 arm, check other arm. Do not tap or slap vein site with your finger or hand. Listen to patient and their advice, but use your own judgment.

• Factors to consider when selecting a vein:
  — Avoid: Burns and the same side of body as mastectomy (do not draw specimen from side on which mastectomy was performed because of lymphostasis). Exceptions are made with written authorization on the patient’s chart or physician order.
  — Avoid Hematomas: May cause abnormal test results. If unable to find another site, draw blood specimen from a site distal to bruised area.
  — Intravenous Fluids: Draw specimen from other arm or have nurse shut off IV for 5 minutes. Specimen can then be drawn above IV site, but this must be documented on collection list or order form so that a note can be entered into computer system. If coagulation tests are ordered or a heparin IV is running, IV must be shut off for 15 minutes prior to draw. Do not draw specimens while a patient is receiving blood unless directed by a physician. It is best to wait a minimum of 1-hour post transfusion, so that blood and chemical constituents equalize within body.
  — Cleanse venipuncture site. Allow area to dry to prevent hemolysis of specimen or burning sensations when puncture is performed.

• Grasp patient’s arm. Arm is held to facilitate venipuncture procedure. If right-handed, grasp patient’s arm firmly with left hand using left thumb to draw skin taunt to anchor vein. Make sure patient’s arm or puncture site is in a downward position so there will be no back flow from tubes into vein. Perform venipuncture:
  — Insert first collection tube onto needle holder. Do not push tube beyond needle end. This will exhaust vacuum in tube.
  — Align needle (bevel up) with vein and insert at 15-degree angle.
  — Push tube onto needle. Blood flow indicates needle is in vein.
  — Patient may open his/her hand after blood flow has been established.
  — Allow tube to fill completely while maintaining a slight forward pressure on tube with thumb to prevent shut off valve from pushing tube off needle and stopping blood flow.
  — When tube is full, remove from holder; and insert next tube into holder while holding needle stable in vein.
  — Invert tubes gently 8 to 10 times to mix all additives.

• Remove needle from arm, activate safety shield, and cover site with sterile gauze/cotton.
• Dispose of used equipment
  — Place needle and holder and any blood saturated equipment in Biohazard containers only. Place all other materials in regular trash.

• Apply pressure for 2 to 3 minutes. Pressure with elevation can be used to prevent bruising. The patient may assist to apply pressure to site. If bleeding persists, apply pressure for 5 minutes, and stay with the patient until bleeding does cease.

• Bandage arm. Tape for sensitive skin is available.
• De-glove. Label all tubes at bedside or in front of outpatient. Improperly labeled specimens are not acceptable. Computer labels are preferred; however, handwritten labels will suffice as long as all information is present. Samples must have 2 patient identifiers.
• Information required:
  — Patient’s legal name*
  — Date of birth*
  — Medical record number
  — Accession number or requested tests
  — Room or facility location
  — Date/time of collection*
  — Initials of person drawing*

*Required for specimens drawn outside hospital

• Properly store tubes for transport. Check specimen type and processing requirements. Send specimens to the laboratory ASAP.

• Wash hands before proceeding to next patient.

Blood Culture Collection

Systemic and Localized Infections: Two blood cultures are indicated with a suspected acute sepsis, meningitis, osteomyelitis, arthritis, or acute untreated bacterial pneumonia.

Note: The yield beyond 2 blood cultures is often negligible. With a fever of unknown origin, initially obtain 2 blood cultures. An additional 2 blood cultures are indicated 24 to 26 hours later. MidMichigan Medical Center policy requires that orders for single blood cultures are not valid for adults. Transport culture vials to laboratory at ambient temperature. Please refer questions to Microbiology Department in Midland at 989-839-3484.

• Cleanse top of both blood culture vials (1 for pediatric draws, see below) with ChloraPrep® after checking expiration date printed on label. Do NOT use expired vials. Always collect blood cultures prior to collecting any other specimens.

• Scrub venipuncture site with ChloraPrep® applicator for 30 seconds with sufficient friction to assure that it reaches cracks and fissures of skin. There is no evidence supporting traditional skin prepping in a concentric circular pattern.

• Allow site to air dry before venipuncture. Do not palpitate vein after disinfecting skin prior to inserting needle.

• Make venipuncture and collect required volume of blood using adaptor method. Please contact any phlebotomist for a demonstration. Blood culture system is very sensitive and any deviation from this procedure could result in growth of contaminants. Volume of collected blood can have a great impact on recovery of organisms from a bacteremic individual. For this reason, whenever possible collect full amount of blood as follows:

  — Newborn: 0.5 mL to 1 mL of blood inoculated directly into 1 small (20-mL) blood culture bottle.
  — Pediatric: 1 mL of blood per year of age. Inoculate directly into 1 small (20-mL) culture bottle if you can obtain 1 mL to 3 mL of blood. If you can obtain 4 mL to 10 mL of blood on a child <10 years old, inoculate blood directly into 1 large (70-mL) culture bottle.
  — Adults: Draw a total of 20 mL of blood (two 10 mL syringes), and inoculate 10 mL of blood into each of 2 large (70 mL) blood culture bottles. If you obtain a total of between 10 mL to 20 mL of blood, divide blood volume you obtain equally between the 2 bottles.
  — Difficult Draws: Blood volumes obtained for culture that are <10 mL from adults will result in notification to ordering physician that a “No Growth” report may be misleading. Volume is a major factor in the successful recovery of a pathogen.

• Label vials. Wash/gel hands. Transport at ambient temperature to laboratory ASAP.

Capillary Blood Collections

Many of the steps for a capillary blood collection are the same as for venipuncture. These include confirmation of orders, identification of patient, order of draw, universal precautions, and labeling of specimens. Site and technique used for capillary collections are the main difference.

• Criteria for Capillary Puncture:
  — Only small amounts of blood are required for analysis (up to 1.5 mL of blood).
  — Patient is an infant under 2 years of age or has poor veins for venipuncture. Capillary puncture is method of choice for infants under 2 years of age.
  — Patient is extremely apprehensive about venipuncture.
  — Patient has only 1 good vein that needs to be “saved” for another procedure.
  — IVs are running in both arms and venous access is not available below IV
  — Mastectomy patients.

• Sites of Choice:
  — Finger lateral aspect of fingertip, usually second or third finger. Acceptable for adults and children 1 year and older.
  — Heel-the medial or lateral portions of plantar (flat) surface of heel. Acceptable for infants, birth to 1 year.
• **Capillary Collection Procedure:**
  — Select a site. Avoid edematous or bruised areas. Never puncture through a previous puncture site. Do not use a hand that has been hanging over edge of bed. Blood in these fingers may be congested or concentrated from lack of movement.
  — Warm site with warm cloths or a commercial warmer to increase blood flow through tissues. A 10-minute warming is required for capillary blood gases.
  — Clean site with 70% isopropyl alcohol. After cleansing, allow site to dry completely. Alcohol will cause rapid hemolysis of blood.
  — Hold infant’s heel with 1 hand or grasp finger firmly. Hold heel with forefinger at arch of foot and thumb, placed proximal to puncture site at ankle.
  — Using a sterile lancet, skin should be punctured once with 1 continuous motion at a very slight angle to skin surface. Tenderfoot® lancing devices are preferred over Becton Dickinson lancets when performing heelsticks.
  — To facilitate collection, pressure of thumb can be eased and reapplied as blood flows. Massaging or milking puncture site must not be done. This may cause hemolysis and produce excess tissue fluid that contaminates specimen.
  — Wipe first drops away with a gauze or cotton, then proceed to collect required specimens. Hematology specimens should be collected first. All specimens collected in MICROTAINERS® containing anticoagulants should be mixed immediately.
  — Place a BAND-AID® or non-allergenic tape and cotton over lanced area while applying gentle pressure to prevent bruising.
  — Label tube. Transport ASAP. Remove gloves and wash/gel hands.

• **Materials Needed:**
  — CIBA Corning® Capillary Blood Collection Kit
  — Alcohol wipes
  — Cotton balls or gauze
  — Heel warmer
  — Tenderfoot® collection device or device to make an incision 1 mm deep and 2.4 mm long
  — Disposable container containing a slurry of ice

• **Capillary Blood Gas Collection on Infants (Not Available at MidMichigan-Gladwin):** Capillary blood, when carefully collected under proper conditions, closely resembles arterial blood and may be used for blood gas studies. Capillary blood may be obtained from heel, finger. Area chosen should be prewarmed to promote arterial circulation before puncture. Puncture should be deep enough to ensure that blood flow is free and rapid.

• **Specimen Required:** A minimum of 85 units of arterialized capillary blood is required. A full capillary tube of 140 units is preferred.