BLOOD COLLECTION PROCEDURE

(Formerly Care Coordination policy: Laboratory Venopuncture P-12)

I. PROCEDURE

Blood is collected from a vein by vacutainer, syringe, or butterfly technique with minimal trauma to the patient. Specimens must be handled according to this procedure to obtain accurate laboratory results.

II. PURPOSE

To establish a standardized approach to proper specimen collection by venipuncture in order to reduce error in collection, minimize patient complications, and provide the most accurate specimen for testing.

III. SCOPE

This procedure applies to UnityPoint Health Methodist/Proctor/Pekin hospitals and any of its employees and/or members of the medical staff engaging in the procedures described herein.

IV. EQUIPMENT

- Appropriate supply of collection tubes for tests ordered

Tube Color	Additive
BACTEC Plus– Gray flip cap	Aerobic Blood Culture
BACTEC Plus– Purple flip cap	Anaerobic Blood Culture
BACTEC PEDS Plus – Pink Flip Cap	Pediatric Blood Culture
Light Blue	3.2% Sodium Citrate
Gold Top Amber Microtainer	Serum Separator, clot activator
Red Top	Serum Tube, non-additive
Green Top Green Microtainer	Sodium Heparin or Li Heparin
Lavender, dark Purple Lavender Microtainer	K2 EDTA
Pink Top	K2 EDTA, Blood Bank
Tan Top	K2EDTA
Gray Top	Sodium Fluoride, Potassium Oxalate

Refer to specific departmental requirements concerning additives or special handling (i.e. drawn on ice, protected from light, specialty tubes, etc.) All blood collection devices and tubes will be stored and handled according to manufacturer's instructions.

- Latex Free Tourniquet
- Disposable gloves
- Alcohol Prep or ChloraPrep FREPP 1.5mL Applicator or Castile Soap Towelette
- Gauze (2 x 2 pads)
- Adhesive bandages, Micropore tape
- Puncture resistant sharps container
- Patient Labels
- Marking Pen
- Collection System:
  1. Vacutainer Safety Holder and Needle (21and 22-gauge needles)
  2. Vacutainer Holder or Syringe with Safety Lock Butterfly Needle (23 and 21 gauge available in ¾ inch)
  3. Syringe with Safety Needle (23g x 1 in, 22g x 1 in or 21g x 1in)
  4. Safety Lancet for Fingerstick
- Blood Transfer Device (for Syringe system)
- Fluid Resistant Gown, if appropriate
- Particulate Respirator or mask; if appropriate
- Goggles/Face Shield, if appropriate

V. **VENIPUNCTURE PROCEDURE**

Use standard precautions and appropriate personal protective equipment to prevent skin and mucous membrane exposure according to Care Coordination Standard Infection Prevention and Control Practices policy.

- Review patient orders and prepare supplies accordingly.
- Select appropriate collection tubes and understand minimum volume requirements, specialty tubes (not listed above), timing, and handling/transport details.
    1. Utilize Laboratory User's Manual for requirements.
    2. Phone the laboratory department for additional help.
    3. Collection of time-sensitive tests:
        a) For a timed pre-dose medication level, check with nursing staff to ensure that the dose was given/not given. If the dose was given, the collect times may need to be re-scheduled.
        b) If the order is for a timed post-dose medication level, check with nursing to ensure that the drug was administered and/or that the drug infusion is complete. If the drug was not administered or if the infusion is not complete, nursing must re-schedule the order.
- Handwash upon entering patient room or collection area, according to Care Coordination Hand Hygiene policy.
- Be alert to isolation rooms or special isolation notices on the patient's room door. Read the isolation sign and follow the instructions carefully. Check with the patient's nurse if instructions are unavailable.
- If patient is not available or out of room for procedures, the collection staff should inform the nursing staff that they were unable to collect. It is the responsibility of the nursing staff to inform the collection staff when patient has returned. In the event of STAT orders, staff may request you to draw patient in the location of the procedure being performed.
- Approach patient, introduce yourself, and inform patient of need to collect blood.
- Ask for patient permission to perform collection. If the patient hesitates or refuses, place emphasis on the point that the physician has ordered the test and blood collection is needed. If gentle persuasion does not work, report the problem to the nurse. The nurse may be able to persuade the patient. Ask the nurse to contact the physician and then inform the laboratory of the decision. Do not collect blood from a refusing patient without a court order.
- Perform patient identification (minimum of two identifiers)

Identification Procedure	Identifiers	Matched Against
Patient with hospital Identification (ID) band	First and last name Date of birth	Patient verbal response with ID band and patient order labels or order screen.
	Medical Record number or CSN	ID band and patient order labels
Inpatient without hospital ID band: Request nurse to have hospital ID band placed on patient prior to specimen collection. Do not collect until this has occurred. If collection is requested STAT, utilize Blood Bank Identification Band before collection, refer to Laboratory Labeling procedure on the HUB.		
Patient without hospital ID band (outpatient, Office collections, health fairs, etc.)	First and last name Date of birth	Patient verbal response with physician's written orders, requisition, or chart and Patient Labels.

- Inquire if patient is fasting if required for testing, or if they are latex sensitive.
    1. Latex sensitive patient will have a green armband and green "Latex Sensitive" sign placed on their door.
    2. Be sure to use latex-free tourniquet, gloves, and bandage when necessary.
- Assemble supplies.
    1. Tourniquet
    2. Gloves
    3. Gauze pads
    4. ChloraPrep /alcohol/castile soap
    5. Collection System items
    6. Appropriate Collection Tubes for tests ordered
    7. Bandage (micropore tape, band-aid)
- Position patient.

1. Patient lying down: Ask to lie comfortably on back, extending arm in a straight line from shoulder to wrist. Place pillow under the arm for additional support.
2. For seated patients: position with arm fully supported, extended straight on armrest, keeping elbow as straight as possible, without hyperextending.
3. Ask for assistance from nurse or phlebotomist with patients that are unable or unwilling to remain still.

- Apply tourniquet 3-4 inches above location. Tourniquet may be placed over patient gown, light clothing, or gauze to eliminate pinching of skin.
- Have patient clench fist, without pumping. If tourniquet is applied for beyond one minute, remove and reapply after two minutes.
- For Lactic Acid Testing: do not clench fist.
- Assess possible vein locations, select site, and determine blood collection system most appropriate.
    1. The preferred veins are the median cubital and cephalic veins located in the antecubital fossa.
    2. Wrist and hand veins are also acceptable but may require the use of a syringe with butterfly or butterfly apparatus.
    3. Ankle or foot veins can be used only if approved by the attending physician.
    4. Avoid areas with extensive scarring, the presence of hematomas, or fistulas.
    5. Do not draw from side of which mastectomy was performed, unless physician approves.
    6. Palpate (probe with a pushing motion) and trace the path of veins several times with the index finger. Differentiate veins which feel spongy and bouncy from rigid tendons and pulsating arteries.
    7. If a vein is not readily apparent, one of the following methods may be used to make a vein more prominent:
        * Massage the arm upward from wrist to elbow.
        * Tap the vein site sharply with the index and second finger a few times.
        * Apply a warm damp wash cloth or heel warming device to the site for 3- 5 minutes.
        * Lower the extremity over the bedside for 1-2 minutes. Check the opposite arm's veins, if possible.
    8. If any intravenous (IV)site is in use:
        * Collect from other arm or at least 3 inches below IV.
        * If you must draw from above IV site, have nurse turn off IV for at least 2 minutes, place tourniquet between IV site and draw site. If drawing below IV site, draw one discard tube with 5mL prior to required collection tubes
    9. Release tourniquet after selecting site.
- Assemble Collection System items:
    1. Vacutainer Holder with Needle:
        * Twist and remove needle cap.
        * Screw holder onto needle until it fits securely.
    2. Vacutainer Holder or Syringe with Safety Lock Butterfly Needle:
        a) Remove set from package.
        b) Thread the luer adapter into Holder until secure fit.
    3. Syringe with Safety Needle:
        a) Remove needle from package.
        b) Thread needle luer adapter into Syringe until secure fit.
- Position Supplies where they are readily accessible. Never place the tray on the bed, eating table, or floor; instead move a chair or table to the bedside. If using a cart, the carts are always to be within arm's reach at bedside, unless in an isolation room, then the cart is to remain behind the taped line.
- Put on gloves.
- Cleanse site.
    1. Alcohol pad should be used in circular motion from center to periphery. Allow to dry completely.
    2. Use betadine or castile soap on patients allergic to alcohol, or in the case of collection of ethanol levels.
    3. For Blood Culture Collection:
        * Pinch ChloraPrep Frepp applicator wings once to activate and release antiseptic.
        * Holding horizontally, allow solution to load sponge.
        * Gently press applicator against site.
        * Once solution is visible on skin, use back-and-forth strokes for minimum of 30 seconds.
        * Allow to air dry for approximately 30 seconds.

* Note: ChloraPrep is not to be used on patients less than 2 months of age. In these cases, utilize betadine or 70% alcohol in circular motion and allow to air dry.

- Reapply tourniquet, do not touch site after cleansing. If you do, it must be re-cleansed. Have patient form fist and hold it. For Lactic Acid testing, do not clench fist.
- Perform venipuncture.
    1. Remove needle cap/sheath, inspect closely for defects.
    2. For Syringe system, break plunger seal, advance it fully forward, expelling all air from barrel before use.
    3. Hold the patient's arm firmly distal to selected site.
    4. Anchor the vein with thumb 1-2 inches below site. Avoid anchoring above site to reduce needle stick injury risk.
    5. Inform patient that you are about to perform collection.
    6. Bevel up, puncture vein with needle at angle of 30 degrees or less. If using butterfly device, hold a wing of the butterfly against the patient's arm to steady the needle while either the vacutainer tube or syringe is filling with blood.
    7. Keep needle as stable as possible, keep back of hand anchored against patient arm.
    8. Follow collection tube order of draw, minimum draw requirements:

	Additive information	Special Volume Requirements
Blood Cultures	• Aerobic first, then Anaerobic • Or Peds	• 8-10 mL fill per bottle, adult • Minimum volume Aerobic 4ml • Minimum volume Anaerobic 3m. • Pediatric, 1-3 mL Minimum volume 0.5 Remove flip-cap, cleanse tops with alcohol wipes. • Mix Gently
Light Blue	Sodium Citrate	Must be filled to minimum fill line on tube. Short draws not accepted. Mix 3-4 times
Red	Non additive Serum	Mix 5 times
Gold	SST Gel with Clot Activator	Mix 5 times
Green:	Heparin, Lithium or Sodium	Mix 8-10 times
Purple, Pink, or Tan	K2 EDTA	Pink needs 5mL for blood bank. Lavender must be at least 1/3 full Mix 8-10 times
Gray	Sodium Fluoride/ Potasium Oxalate	Mix 8-10 times Must be 1/3 full
• If using Safety-Lok Butterfly device, and a sodium citrate tube is the first tube required, draw a small volume into extra non-additive or sodium citrate tube and discard, then collect sodium citrate tube for specimen. • If drawing below IV site, draw one discard tube with 5mL prior to required collection tubes. • If other specialty tubes are required, draw in order according to tube additive.		

9. Collect specimen:
    * For Vacutainer Holder system:
        1) Push first tube onto needle. Carefully hold the vacutainer holder to prevent needle movement.
        2) Once blood appears into first tube, ask patient to release fist.
        3) Allow tube to fill to appropriate volume, until vacuum is exhausted. Pull back and remove tube.
        4) Avoid tilting
        5) Push subsequent tube onto needle.
        6) While each tube fills, gently mix the previous tube by inversion 8-10 times.
        7) Remove last collected tube.
        8) Release tourniquet.
        9) Retrieve gauze, carefully withdraw needle from site, applying digital pressure to site using gauze until bleeding stops.
        10) Activate needle safety device:
            – Eclipse: Position thumb on orange safety shield pad, push shield forward to cover needle. An audible click should be heard. Lock into place, inspect that it is activated.

- Butterfly: Hold tubing in hand. Grasp either wing with one hand and grip area of yellow safety shield base with other hand, slide wings back into rear slot until click is heard.

11) Immediately dispose of needle into sharps container, do not transfer hands or hand-off to another employee.

* For Syringe technique:
    1) Once vein is entered, a flash of blood will appear in the syringe hub.
    2) Ask patient to release fist.
    3) Wihdraw the desired amount of blood by holding the barrel of the syringe firmly in one hand while using the other hand to gently pull back on the plunger. Do not force flow, it can hemolyze sample
    4) The hand holding the syringe barrel should remain braced on the patient's arm to prevent movement of the needle.
    5) When desired amount is collected, release tourniquet.
    6) Retrieve gauze, carefully withdraw needle and apply digital pressure to site using gauze until bleeding stops. You may have patient apply pressure for you if you are there to monitor.
    7) Activate Safety Needle: Push lever arm completely forward until needle tip is completely covered. Visually confirm lever arm has fully advanced.
    8) Acting quickly in order to prevent sample clotting, remove needle from syringe and dispose of into sharps container.
    9) Attach Blood Transfer Device to syringe.
    10) Using order of draw, push first collection tube onto transfer device, allow to fill until vacuum is exhausted, and tube stops filling.
    11) Remove tube, push subsequent tube onto needle.
    12) Mix all tubes by gently inversion 8-10 times.
    13) When all required tubes are filled, remove last tube and dispose of transfer device with attached syringe into sharps container.

c) If you have difficulty obtaining blood:
    1) Change the position of the needle. Feel gently for the needle, if it has penetrated too far into the vein, pull it back a bit. If it has not penetrated far enough, advance it farther into the vein. Rotate the needle half a turn.
    2) Try another tube, as the one being used may not have had sufficient vacuum.
    3) Loosen the tourniquet. It may have been applied too tightly, thereby stopping the blood flow.
    4) Probing is not recommended as it is painful to the patient. Attempt to collect the specimen from another site.

d) If you are unable to obtain specimen after 2 attempts:
    1) Inform patient and nurse that another phlebotomist or nurse will be back to attempt.
    2) Arrange for another person to perform venipuncture.
    3) If after 4 unsuccessful attempts total, specimens are not obtained, the responsible nursing personnel or physician will be informed so that an alternate method of collection can be considered. In the event the requested testing is critical to patient care, a physician approval MUST be obtained for additional attempts.
    4) Write explanation of attempts made, by whom, date/time, time/name of nurse notified, and physician's name. Physician may suggest limited testing, microcollection technique, or perform arterial puncture. Enter in RL Solutions.

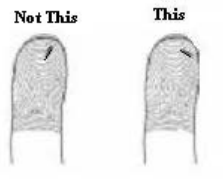
- Apply bandage once bleeding subsides.
    1. Obtain fresh piece of gauze.
    2. Fold and cover puncture site.
    3. Cover with adhesive bandage or tape.
    4. Inform patient to keep bandage on for at least 15 minutes.
    5. If bleeding persists for more than 5 minutes or hematoma forms, notify nurse and maintain pressure on site.
    6. Do not apply a bandage onto a *patient less than 2 years of age*, as it could become a choking hazard.
- Immediately label patient specimens at the bedside.
    1. A lab generated label or chart label will include all necessary information.
    2. Document your initials or Tech Code and date/time of collection on label.
    3. Document on label if specimen was collected below IV site.

4. If blood cultures were collected, document on label location of collection site.
5. If computer generated labels are not available, you must handwrite this minimum information on each tube:
    * Patient First and Last Name
    * Date of Birth and/or Medical Record Number
    * Collection Date and Time
    * Collector's initials
6. Avoid labeling over the colored edge of collection tube label.
7. Position labels in a straight, vertical manner with patient name closest to cap.
8. Additional labels may accompany specimens to lab.
9. Do not pre-label under any circumstances. The label must be affixed to the specimen tube in the presence of the patient.

- Follow special handling instructions immediately after collection. This includes storing on ice, protection from light, and/or immediately delivery to lab.
- Completion of Blood Draw
    1. Discard of any waste. Any items with visible blood contamination must be discarded in marked biohazard bags. Other waste may be discarded in patient wastebasket.
    2. Raise bedrails, lower bed, and return any moved tables back to their original locations.
    3. Gather all tubes, extra labels for delivery to lab.
    4. Thank patient for their cooperation.
    5. Wash hands upon exiting room according to Hand Hygiene policy.
    6. If IV had been turned off, inform nurse collection is complete and that it may be restarted.
    7. Delivery specimens to laboratory processing area.

VI. FINGERSTICK PROCEDURE

- Wash hands
- Wear gloves and protective equipment as necessary
- Prepare the finger
    1. Avoid a finger that is cold, cyanotic (blue), swollen, or inflamed.
    2. Apply a gentle massaging motion to the hand and finger moving your hand from the wrist toward the tip of the patient's finger to warm the area and to increase blood flow.
    3. Repeat this massaging process 5 or 6 times.
    4. Cleanse the ball or pad of the finger with the alcohol swab. Do not use iodine solutions to cleanse the skin.
    5. Wait for alcohol to dry to avoid an unacceptable specimen due to hemolysis. Waiting for the alcohol to dry allows it to kill the bacteria.
    6. Use either the patient's long finger or ring finger.
    7. Reassure the patient, by saying, "This will hurt just for a moment."
- Perform the skin puncture
    1. Pick up a sterile blood safety lancet and remove the safety on the lancet.
    2. Grasp the sterile blood safety lancet firmly.
    3. Grasp the patient's finger firmly.
    4. Press the lancet against the side of the ball of the finger with a quick motion to make the cut across the fingerprints.
    5. Dispose of the safety lancet in a sharps container, even though it has been drawn back into the plastic.



- Eliminating the first drop

    <u>If blood moves freely:</u>
    1. Use a dry gauze sponge and wipe away the first drop.
    2. Dispose of gauze sponge.

    <u>If blood does not flow freely:</u>
    1. Increase the blood flow by holding finger downward and applying gentle continuous pressure just above the puncture site.
    2. After the puncture, do not massage the area since this may contaminate the blood sample with tissue fluid.

3. If the blood flow stops flowing freely, use an alcohol pad to open the puncture area, discard the first drop of blood and continue to collect the sample. You may apply pressure from the wrist to the fingertips to collect the sample.
4. If blood does not flow easily when first punctured, apply pressure from the wrist to the fingertip and make another puncture.

- Producing a large rounded drop
  1. If the cut is made across the fingerprints and the area has been wiped dry, the blood should well up into a large rounded drop.
  2. If the cut is made along the lines of the fingerprint, the blood will stream down the finger.
  3. Apply moderate pressure just below the puncture to produce this rounded drop.
  4. Release pressure, collect sample, and repeat this process until the microtainers are filled between the minimum and maximum lines.
  5. Do not milk the finger.
  6. Mix the microtainer after each drop is collected in the lavender microtainer, and do not fill above the 500uL mark.
  7. Remove gloves and wash hands at the end of the procedure.
- *Order of draw for skin punctures*
  1. *Blood Gas, if ordered as capillary blood gas.*
  2. *Lavender microtainer*
  3. *Green microtainer*
  4. *Amber microtainer*
- Labeling
  1. Label tubes
     - Patient's first and last name
     - Patient's date of birth or MRN number
     - Collection date
     - Collection time
     - Collector's initials
  2. Affix a label directly to the tubes. Place the tubes inside the larger clear microtainer holder and label the holder.
- Tips for successful finger puncture in children
  1. Explain to the patient (and parents if the child cannot understand) exactly what you will be doing.
  2. Talk to children in a soft and reassuring manner.
  3. Let children participate by holding a sticker or special band-aid.
  4. Make sure all equipment is ready ahead of time.
  5. Have the child sit on their parent's lap so that they can help to hold the child.
  6. Warn the child prior to puncturing the finger.
  7. Use the middle finger or ring finger for the puncture.
  8. Use a puncture device appropriate for the size of the child's finger.
  9. Wipe away the first drop; avoid milking the finger.
  10. Know the quantity of blood needed. Refer to the chart below indicating the maximum volume of blood to be drawn for children.

VII PROCEDURAL NOTES

- Do not enter the room while the doctor is visiting with the patient; come back at another time. If you have a STAT order, politely ask if the physician would like the sample drawn now or at another time.
- Take special care when collecting blood from semi-conscious or comatose patients. Anticipate unexpected movements while introducing the needle or while it is in place in the arm. Gauze should be readily available, and the tourniquet quickly released in the event the needle is violently removed or re-positioned. Inform the nurse who will examine the area for possible damage.
- Best practices suggest that specimen collection not be performed during blood transfusions, however if the physician insists, collections maybe performed. Note specimen was collected while blood was being transfused.
- When collecting blood from patients under 14 years of age, obtain the patient's weight. Do not collect more than the recommended maximum volume of blood at any one time. See table below. If more than

the allowable volume is required, the physician must be notified for consultation. The orders may be prioritized, divided, etc... The physician will make the final decision.

VIII. PROBLEM-SOLVING TIPS

- Hematoma formation:
  1. Remove the tourniquet and withdraw the needle from the patient's arm immediately.
  2. Place three to four gauze squares over the hematoma and apply pressure for 2-5 minutes.
  3. Apply a pressure bandage (fold a square gauze and place under co-flex) to venipuncture site.
  4. Inform the patient that they may have a black and blue mark for a few days, notify nurse.
- Weakness, Dizziness or Nausea

1. Remove the tourniquet and withdraw the needle from the patient's arm.
   2. Make the patient as comfortable as possible. (If sitting, have the patient bend their head toward their knees.)
   3. Instruct the patient to breath deeply and slowly.
   4. Apply a cold compress to the patient's forehead, if necessary.
   5. Offer a cool glass of water.
   6. If an outpatient, stay with the patient until completely recovered. If necessary, call a pathologist to check the patient.
7. If an inpatient, report the incident to a nurse.

- Fainting
  1. Remove the tourniquet and withdraw the needle from the arm immediately, apply pressure.
  2. If the patient is sitting, hold the patient in the chair.
  3. Administer an ammonia inhalant. If spirits are strong, wave it under the patient's nose briefly.
  4. Apply a cold compress to the patient's forehead and/or back of neck.
  5. If an outpatient, remain with the patient until completely recovered.
  6. If unresponsive, dial 33333, and request a Medical Alert to your location: Identify if infant, pediatric, adult, or non- patient.
  7. If an inpatient, report the incident to a nurse.
- Vomiting
  1. Remove the tourniquet and withdraw the needle from the arm immediately.
  2. Provide the patient with a suitable receptacle and tissues.
  3. Give the patient a glass of water to rinse out his/her mouth.
  4. If an outpatient, remain with the patient until he/she is completely recovered or call a pathologist if help is needed.
  5. If an inpatient, report the incident to a nurse.
- Convulsions
  1. Call for help immediately.
  2. Try to prevent the patient from injuring himself/herself. (During severe seizures, some individuals exhibit great muscular strength and are difficult to restrain.)
  3. If an outpatient, call Rapid Response and call a pathologist Have the patient seen by a physician. If the collection is taking place at a location outside of the main hospital, call 911.
- Cardiac or Respiratory Difficulties
  1. Call a Medical Alert-Cardiac Arrest by dialing 33333 or turning on “code blue” light switch.
  2. If collection is occurring at location outside of main hospitals, call 911.
- Incident reports should be filled out on any patient with weakness, dizziness, fainting, or convulsions.

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Guide for maximum blood draw volume on any patient under the age of 14.

Patient Weight		Max. amount to be drawn at one time, mL	Max. amount to be drawn during hospital stay (1 month or less, cumulative) mL
Pounds	Kilograms		
6-8	2.7-3.6	2.5	23
8-10	3.6-4.5	3.5	30
10-15	4.5-6.8	5.0	40
16-20	7.3-9.1	10	60
21-25	9.5-11.4	10	70
26-30	11.8-13.6	10	80
31-35	14.1-15.9	10	10
36-40	16.4-18.2	10	130
41-45	18.6-20.5	20	140
46-50	20.9-22.7	20	160
51-55	23.2-25.0	20	180
56-60	25.5-27.3	20	200
61-65	27.7-29.5	25	220
66-70	30.0-31.8	30	240
71-75	32.3-34.1	30	250
76-80	34.5-36.4	30	270
81-85	36.8-38.6	30	290
86-90	39.1-40.9	30	310
91-95	41.4-43.2	30	330
96-100	43.6-45.5	30	350