Chapter 36

Emergency Whole Blood Collection

Introduction
This chapter describes the steps for emergency whole blood collection.

MATERIALS AND EQUIPMENT

Miscellaneous
- Sharps containers
- Biohazard bags
- Trash bags
- Leak-resistant chucks
- Ammonia inhalants
- Cold packs
- Test tube racks

Donor Screening
- Emergency Donor List
- Modified DD Form 572
- Clipboards

Vitals
- Sphygmomanometer
- Stethoscope
- Lancets
- Alcohol pads
- 2 x 2 gauze

Bag Issue
- Emergency Whole Blood Collection Log
- ISBT (International Society of Blood Transfusion) labels (if available)
- ABO/Rh stickers (if available)

Phlebotomy and Supplies

- Donor chest
- Donor chair
- Blood bag scales (HemoFlow)
- Blood bag stand
- Terumo single blood bags
- Frepp/Sepp kit
- Gloves
- Surgical tape
- 4 x 4 gauze
- Hand stripper, sealer, cutter
- Hand sealer clips
- Scissors
- Hemostats
- VENOJECT Luer Adapter
- Luer Adapter hub
- Collection tubes
  - 3 EDTA plasma tubes (purple top)
  - 3 serum separator tubes (marble top)
- Coban self-adherent wrap
- Rapid Malaria Screening Test
- Rapid HCV Screening Test
- Rapid HIV Screening Test
- Rapid HBsAg Screening Test
- Rapid RPR Test for syphilis
- Antiserum for ABO/Rh testing

DD Form 572: Blood Donation Record; EDTA: ethylenediaminetetraacetic acid; HBsAg: hepatitis B surface antigen; HCV: hepatitis C virus; HIV: human immunodeficiency virus; RPR: Rapid Plasma Reagin; Sharps: refers to sharp objects (needles, scalpel blades, disposable scissors, stylets, trocars, glass, etc).

Activation/Donor Screening

- An order to activate the walking blood bank must come from the medical providers caring for the intended recipient of fresh whole blood.
- Once the proper order is obtained in the laboratory from the appropriate medical staff, the recipient blood type must be obtained.

- Once the recipient ABO/Rh blood type is known, the walking blood bank is activated. Laboratory personnel will then interview donors for suitability to donate and review the modified DD Form 572, and determine if the donor is a **GO** or **NO GO** for donating whole blood.
- If the donor is accepted, record donor temperature, heart rate, and blood pressure on the modified DD Form 572 to ensure adequacy for donation: temperature <99.6°F, heart rate <100 beats per minute, and blood pressure ≤180/100 mm Hg.

Bag Issue

- For donors found to be suitable for donation:
  - Verify donor with DD Form 572.
  - Label the donor bag segment number from the collection line. The unit number should be linked to the donor card (DD 572) and be unique to that individual donation. Unit can get donor unit numbers from its supporting blood detachment.
  - Properly fill out the Emergency Blood Bank Donor Log. Annotate bag lot number, manufacturer, expiration date, and anticoagulant used on the donor's modified DD Form 572.

Performing Phlebotomy

- Confirm with donor his/her full name, the last 4 digits of the Social Security Number (SSN), date of birth, and check against DD Form 572. Also, check to make sure all of the donor's information is correctly recorded on the donor blood bag.
- Place blood pressure cuff on the donor's arm. Pump cuff up to 40–60 mm/Hg and inspect arm for appropriate vein. Palpate vein. Release pressure.
  Note: You may use a rubber tourniquet.
- Ask the donor if he/she has an allergy to iodine, Betadine, shellfish, or latex. If no allergies exist, use the Frepp/Sepp kit to prepare the donor arm for phlebotomy.
  - First take the scrubbing pad (Frepp) out of the wrapper without touching the pad. Break the ampule and scrub a 3-inch site for 30 seconds.
  - Then, take the ampule (Sepp), break it, and place it directly in the middle of the intended phlebotomy site. Starting in the middle of the phlebotomy site and moving in concentric

circles, swab an area 3 inches in diameter without overlapping. Ensure that the entire area is covered with iodine Sepp.
  - Place 4 x 4 gauze over the site and allow to air dry.
  - **If an allergy to iodine, Betadine, or shellfish exists, an alcohol alternative or chlorhexidine product may be used.**
- Label all six blood collection tubes (3 red/marble top tubes and 3 lavender top tubes) with donor demographics:
  - Full name.
  - SSN.
  - Date/time of collection.
- Properly label the blood collection bag.
  - Ensure that the **date of collection** is written on the unit in the space provided and document the **time the phlebotomy was initiated** underneath the collection date.
  - Document the expiration date and time in the space identified on the right-hand side of the blood collection bag. **Expiration date is 24 hours after the date and time of collection**.
  - Do not write the donor's blood type until the blood has been typed and tested.
  - After all labeling of the blood collection bag has been accomplished, apply hemostats approximately 6 inches above the needle.
- Donor blood unit and sample tube collection.
  - Pump blood pressure cuff up between 20–60 mm Hg. A rubber constricting band or tourniquet may be used instead of a blood pressure cuff.
  - Verify vein again, **but do not repalpate**. Advise the donor to make a fist and squeeze several times. Then squeeze and hold.
  - Twist off the needle cover and inspect the needle for barbs or other defects.
  - Pull the skin taut below the venipuncture site. This helps prevent sudden movement of the arm and anchors the vein.
  - With the bevel up, hold the needle at the hub. At approximately a 30°–45° angle, pierce the skin at the selected point of entry. When the bevel is completely under the skin, lower the angle of the needle to approximately 10° or less. With a steady push, advance the needle to penetrate the vein wall.

Thread the needle approximately ½ inch inside the vein to maintain a secure position and to lessen the chance of a clot forming.

- Release the hemostat clamp on the collection bag tubing and observe the blood flow through the tubing and into the collection bag.
- If there is no blood flow, try adjusting the needle without hurting the donor, and seek assistance from another phlebotomist before discontinuing the procedure.

  Note: A second venipuncture may be performed if there was an unsuccessful collection (no blood entered the collection bag), if donor agrees to a second venipuncture, and an acceptable vein is available on the opposite arm**. The second collection requires a new blood bag to prevent contamination of the unit!**
- Fill sample tubes using the tube adapter. After filling pilot tubes, verify once again that donor identification information on the tubes correspond to the donor identification information on the collection bag.
- Instruct the donor to relax his/her grip and to squeeze rhythmically every 3–5 seconds.
- Secure the needle to the donor's arm with tape across the hub and/or on the tubing near the hub of the needle. The tape optimizes the positioning of the needle and prevents rotation of the needle while in the vein.
- Partially reduce the pressure by loosening the tourniquet or blood pressure cuff to approximately 20–40 mm Hg.
- Cover the phlebotomy site with a 4 × 4 gauze dressing, keeping the site clean and the needle out of view. Lift the gauze occasionally to monitor for evidence of a hematoma.
- Annotate on the DD Form 572 the time phlebotomy was started in the "start" block and supply the initials of the laboratory technician performing the phlebotomy. Ensure that the start time is annotated beneath the collection date on the collection bag.
- Monitor the donor for signs of discomfort or the onset of a donor reaction, such as dizziness or fainting.
- Manually mix the blood and anticoagulant every 90 seconds to prevent clotting in the line and bag.

- Watch for the scale to read an optimal volume of 450 mL (digital scale). For trip scales, the scale will drop, indicating the desired weight.
- Annotate the time the unit has reached the desired volume on the DD Form 572 in stop time block. **Acceptable units can have a volume between 405–495 mL**.
- Clamp the tubing 1 to 2 inches below the "Y" segment of tubing using the metal seal clips and the hand crimper.
- Strip a segment below the first clamp (away from the needle) and place another clamp in this location using a metal seal clip and a hand crimper. Then, cut the segging just below the first clamp closest to the needle, but between the two metal clamps.
- Connect the multisample Luer adapter to the tube holder. Remove covers and connect the multisample Luer adapter to the female Luer at the end of the donor sampling tubing. Break the ampule in the donor sampling tubing to open the blood pathway and insert the blood collection tube firmly into the tube holder. Remove sample tube when full. Repeat to collect additional samples (3 EDTA tubes and 3 red top tubes).
- Remove blood pressure cuff. Place fingers of 1 hand gently over the 4 × 4 gauze. **DO NOT apply pressure over the needle.** With the other hand, smoothly and quickly withdraw the needle.
- Apply firm pressure to the phlebotomy site and instruct the donor to maintain pressure on the phlebotomy site and extend the arm vertically. Instruct the donor **NOT** to bend the arm at the elbow to reduce/prevent the chance of a hematoma.
- On completion of venipuncture, shout "Sharps" and discard into a biohazard container.
- Using a hand stripper/crimper, strip all blood from the tubing into the primary collection bag and invert bag a minimum of 3 times.

Postdonor Care

- Apply pressure with fresh gauze on the collection site and wrap with Coban, ensuring a stable clot has formed.

- When the donor is ready to stand, have him/her walk to the designated recovery room and remain in the area under close supervision. Observe for signs of a reaction and ask donor how he/she feels.
- Instruct the donor on fluid replacement and light postdonation activities. Provide extra rest time for donors who have experienced a donor reaction: either dizziness or fainting.
- Ensure the ability to rehydrate orally and walk with a steady gait without dizziness prior to discharge from the recovery room.

Performing Rapid Testing

- WHEN AVAILABLE: **ABO/Rh** blood typing, and rapid testing for **HIV (human immunodeficiency virus), HCV (hepatitis C virus), HBsAg (hepatitis B surface antigen), and malaria** will be performed with documented appropriate results prior to the release of fresh whole blood from the laboratory. **Rapid testing for syphilis will be performed on each donor's blood during the walking blood bank**. However, given the duration of time required to centrifuge the blood sample for this test and the batched nature of the test, results will be obtained prior to the conclusion of the walking blood bank, but not prior to release of the donor unit from the walking blood bank. **Follow appropriate testing standard operating procedures for each rapid test performed: ABO/Rh, HIV, HCV, HBV (hepatitis B virus), malaria, and RPR (Rapid Plasma Reagin) for syphilis.**
- Document test results of ABO/Rh and all infectious screening on the DD Form 572, in the Walking Blood Bank Donor Log Book, and on the donor's blood bag.
- The laboratory technician performing each test will place his/her initials on the donor's blood bag.

Releasing Whole Blood

- Label fresh whole blood bags as **VERIFIED**.
  - ABO/Rh result.
  - Results from rapid screening tests for **HIV, HCV, malaria, and HBsAg**.
  - The **initials** of the laboratory technician who performed each test (**1** = technician performing ABO/Rh typing; **2** = technician performing infectious testing).

  - **Initials** of the laboratory technician who has verified each result (**3** = technician performing blood bag stripping).
  - The **patient number** of the recipient patient.
  - **Donor's full name**.
  - **Last 4 digits of the donor's SSN**.
  - **Date of unit collection.**
- Only after all of the above labeling and cross-checks will the donor blood unit be released from the laboratory for transfusion.
- **Proper blood typing and infectious screening require time**. This is at times at odds with the deterioration of the recipient patient's clinical status. In such circumstances, if the **licensed clinical providers caring for the recipient patient** deem it necessary to obtain fresh whole blood at a faster rate, they **may authorize** the emergency release of fresh whole blood from the walking blood bank after only ABO/Rh typing without the completion of all infectious screening tests. This is to be meticulously documented by laboratory personnel, and they must obtain written documentation of this directive from the licensed provider(s) on the standard fresh whole blood release form. All fresh whole blood units released in this fashion will be documented as such in the Walking Blood Bank Log.
  Note: Fresh whole blood may be kept stored at room temperature for up to 8 hours. However, it is highly recommended that units of fresh whole blood be stored immediately following collection at 1°–6°C for up to 24 hours.

Posttransfusion Verification

- All results from RPR rapid testing for syphilis will be reviewed prior to the completion of the walking blood bank. Any positive results will be relayed to the Lab Officer, with medical follow-up to be directed by the Lab Officer in conjunction with the Unit Chief of Professional Services (CPS).
- After completion of the walking blood bank, all donor blood units—or donor unit blood bags posttransfusion—will be returned to the laboratory.
- Laboratory personnel will verify the disposition of **ALL** donor units and document this in the Walking Blood Bank Log as:
  - Transfused.

  - Returned **NOT** transfused.
  - Held in laboratory and **NOT** released and why.
  - Sent with recipient patient in transport to another facility.
- All donor blood units transfused will be documented on the daily Blood Report.
- Regular contact will be maintained with the Blood Support Detachment to obtain follow-up results on confirmatory testing of donor blood samples.

Specimen Processing

- During whole blood collection, 6 tubes of blood will be drawn for further testing.
  - 3 red top tubes.
  - 3 EDTA tubes.
- Tubes will be spun down to separate serum / plasma from red blood cells.
- Serum will be collected and stored in appropriate blood tubes with the correlating donor modified DD Form 572 with proper refrigeration.
- A photographic copy of all modified DD Form 572's will be made prior to shipment and maintained in electronic storage with a backup CD copy made after every walking blood bank.
- Specimens will be shipped to the Blood Support Detachment for shipment for FDA (US Food and Drug Administration)-licensed confirmatory testing.

Onsite Specimen Processing

- Spin down tubes for 10 minutes at 3,000 rpm's.
- Using a transfer pipette, transfer serum from the spun-down specimen into a transfer tube. Label the transfer tube with the donor's demographics. Secure the cap on the transfer tube.
- Ship all specimens in a shipping container with cold packs as soon as possible to the Blood Support Detachment for further processing. Ensure that a copy of the donor's DD Form 572, rapid testing result sheets, and the recipient information sheet are sent with the specimens.

Blood Donor Criteria

- **Appropriate donor criteria.**
  - Donor weight: ≥110 lbs.
  - Blood pressure: ≥180/100 mm Hg.
  - Pulse: 50–100 beats per minute (may be <50 if donor is athletic).
  - Temperature: <99.6°F.
- **Medications.**
  - Do not collect from donors currently on antibiotics, to exclude antimalarial prophylaxis.
  - Donors taking medications that competent medical authority deems may cause harm to the recipient must be deferred from donating.
  - **Be advised**: If the purpose of the whole blood drive is to derive a source of platelets and clotting factors for a recipient, then donors who have taken aspirin in the last 72 hours should be deferred.
- **Recent donation.**
  - A single unit of whole blood or a blood component may be drawn from a single donor no more often than every 60 days.

References

American Association of Blood Banks. *AABB Standards*. 4th ed. Bethesda, MD: AABB; 2012.

American Association of Blood Banks. *Technical Manual*. 17th ed. Bethesda, MD: AABB; 2011.

National Committee for Clinical Laboratory Standards. *Clinical Laboratory Technical Procedures Manual: Approved Guideline, GP02-A5*. 5th ed. Wayne, PA: NCCLS; 2002.

For Clinical Practice Guidelines, go to
http://usaisr.amedd.army.mil/clinical_practice_guidelines.html