Chapter 36

Emergency Whole Blood Collection

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

All blood support requests should be routed to the area or combatant command Joint Blood Program Office (JBPO). The JBPO can assist with training and resources 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
- Lancets
- Alcohol pads
- 2 x 2 gauze

Donor Screening
- Emergency Donor List
- Modified ASBP 572-EWB form
- Clipboards

Vitals
- Sphygmomanometer
- Stethoscope
- Temperature monitor

Logistical
- Emergency Whole Blood Collection Log
- ISBT (International Society of Blood Transfusion) labels or DIN labels; request from BSD
- Deferral lists

Phlebotomy and Supplies - Best Case Scenario (Role 3)
- Chinook kits
- 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

Phlebotomy and Supplies – Role 2 and below

- Whole blood kits
- System for prescreening → should be done prior to arrival at location or have a system to outsource prescreening

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).
The rapid HBsAg is not FDA approved and these "rapid" tests take at least 20 mins if all done simultaneously. The RPR (syphilis) test requires a centrifuge because the test requires serum not whole blood.

Activation/Donor Screening

- An order to activate the walking blood bank must come from the Commander of the medical unit under the advisement of the Chief Medical Officer or senior surgeon caring for the intended recipient of fresh whole blood.
- The recipient/patient blood type must be obtained by laboratory or rapid kit testing.
- If a patient has already been massively transfused with universal donor blood products, if may be difficult to determine their original blood type. In this situation, it is good to have low titer O donors pre-identified and the patient should continue to receive low titer O whole blood (LTOWB) or universal blood components (O red blood cells [RBCs]/A or AB plasma).
- Fresh whole blood (FWB) must be a type-specific match to the recipient/patient (ie, A to A, B to B, and O to O). If type O donors have been titer tested and found to be low titer (anti-A and anti-B <1:256), FWB from these donors may be given to any patient regardless of blood type. ABO/Rh of donor should be verified at time of donation. Titer testing will normally be completed prior to deployment and should be performed within 12 months of donation.
- Once the recipient ABO/Rh blood type is known, the walking blood bank is activated by calling in donors of the patient's blood type. Laboratory personnel, or other trained individuals, will then interview donors for suitability to donate and review the ASBP 572-EWB, and determine if the donor is a **GO** or **NO GO** for donating whole blood. Due to staffing limitations at

some deployed facilities, it is important to ensure non-medical staff have been trained to do the majority of these whole blood donor screening tasks.

Ensure donor reads and signs the consent statement at the bottom of the ASBP 572-EWB. If donor refuses to sign the statement, then the individual is deferred from donation.

- Donors of the required ABO type who have been pre-screened are preferred over donors with no history of pre-screening.
- If the donor is accepted, record donor temperature, heart rate, and blood pressure on the ASBP 572-EWB to ensure adequacy for donation: temperature <99.6°F, heart rate <100 beats per minute, and blood pressure £180/100 mm Hg.
  - Each donor gets one sheet of ISBT labels. One label will go on the ASBP 572-EWB and the rest can be placed on the back of the donation bag.
  - If ISBT labels are not available, label the ASBP 572-EWB, donation bag, and sample tubes with a unique donor identifier such as service number.
  - Properly fill out the Emergency Blood Bank Donor Log. Annotate bag lot number, manufacturer, expiration date, and bag tubing segment number on the donor's ASBP 572-EWB.

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 the ASBP 572-EWB.
- Confirm that the donor identification number on the ASBP 572-EWB and whole blood bag match.
- 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 ChloraPrep Swabstick to prepare the donor arm for phlebotomy.
  - It is imperative to properly sterilize the site so that skin contaminates are not introduced into the unit of blood.

  - **If an allergy to iodine, Betadine, or shellfish exists, an alcohol alternative or chlorhexidine product may be used.**
- **A loose knot should be made in the tubing between the needle and the bag so that it can be tightened before the needle is removed from the arm.**
- Label all six blood collection tubes (3 red/marble top tubes and 3 lavender top tubes) with one of the bar coded labels from the back of the donor bag. If bar coded labels are not available, then be sure they are labeled with:
  - Full name.
  - SSN or other unique service number.
  - 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. However, if extenuating supply concerns exist, may coordinate with JBPO for extended storage of the product for 21 or 35 days.**
  - 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 40–60 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!**
- The donor bag must be below the level of the donor so that gravity can help to fill the bag more quickly.
- 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 ASBP 572-EWB 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.
- **Sample tubes may be collected via the whole blood bag system if a sample port is included. If there is no sample port on the whole blood bag tubing, perform a second venipuncture on the other arm to fill the donor sample tubes.**
- A 10-inch piece of 550 cord may be used to determine when whole blood bag is full. As the bag fills, the piece of cord can be placed around the center of the bag and when the ends of the cord touch, the bag is full. There is a tendency to under-fill the bags because most people are used to seeing packed red blood cells which are roughly half the volume in the same size bag.
- Annotate the time the unit has reached the desired volume on the ASBP 572-EWB in stop time block. **Acceptable units should have a volume between 405 and 495 mL.**
- Place the hemostat 1 to 2 inches below the hub of the needle.
- Remove blood pressure cuff.
- The knot that was placed in the tubing must be tightened prior to smoothly and quickly withdrawing the needle.
- Apply firm pressure to the phlebotomy site with the gauze 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, use a knife or scissors to cut the tubing between the knot and the needle. Discard the needle into a secure biohazard container.

Postdonor Care

- Apply pressure with fresh gauze on the collection site and tape it down, ensuring a stable clot has formed.
- When the donor is ready to stand, have him/her remain in the area under close supervision for at least 10 minutes. 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 leaving the area.

Performing Rapid Testing

- **ABO/Rh** blood typing of the donated unit must be performed and verified using lab testing or Eldon card, with appropriate results documented prior to the release of fresh whole blood from the laboratory. Rapid tests for HIV, HBV, and HCV should be performed prior to transfusion when time permits. (Other rapid disease test kits for malaria and syphilis maybe also be available). **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. If not performed prior to whole blood transfusion, rapid disease tests should be performed as soon as time permits and should not be skipped.**
- Document test results of ABO/Rh on the bag of whole blood and on the ASBP 572-EWB. Use standardized forms to document the results of all rapid infectious disease testing.
- The laboratory technician performing each test will place his/her initials on the donor's blood bag.
- Prior to releasing FWB for patient use, all testing of the donor and patient should be verified and documentation checked for accuracy. Ensure donor screening is appropriately documented and donor is not deferred. Ensure the correct ABO/Rh type of the patient and donor are recorded and are compatible.
- **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 personnel, and they must obtain written documentation of this directive from the licensed provider(s).

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

- After completion of the walking blood bank, all donor blood units—or donor unit blood bags posttransfusion—will be returned to a person who has Theater Medical Data System (TMDS) access to properly document the donations, destructions and the transfusions in the system.
  - If some of the fresh whole blood is sent with the patient in transport to another facility, ensure the TMDS administrator is informed and can "ship" these units in the system.

Specimen Processing

- During whole blood collection, draw the specified tubes of blood for further testing:
  - 3 pearl or purple top tubes.
  - 2 gold or red top tubes.
  - 1 purple top tube—used for blood typing/Eldon card.
- Tubes will be spun down to separate serum/plasma from red blood cells. If a centrifuge is not available, get the tubes to a Role 2 or 3 that has a centrifuge within 24 hours if at all possible.
- Specimens will be shipped to the Blood Support Detachment, Blood Support Unit, or other designated receiving unit for shipment for US Food and Drug Administration (FDA) licensed infectious disease testing.

Onsite Specimen Processing

- Spin down tubes for 5 minutes at 4,000 rpm's.
- Using a transfer pipette, transfer serum from the spun-down specimen into a transfer tube. Label the transfer tube with the the donor identification number or ISBT label. Secure the cap on the transfer tube.

- Ship all specimens in a shipping container with cold packs or 14 pounds of wet ice as soon as possible.

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.
  - Reference drugs listed on the back of the ASBP 572-EWB to determine medications that can exclude donation.
  - **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 may be drawn from a single donor no more often than every 56 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://jts.amedd.army.mil/index.cfm/PI_CPGs/cpgs