

SERUM SEPARATION PROTOCOL FOR FIELD PERSONNEL

*Provided by the
Texas Department of State Health Services,
Laboratory Services Section*



Personal Protective Equipment (PPE)



TYPES OF PPE

Gloves, eye protection, lab gown, and respiratory protection as required

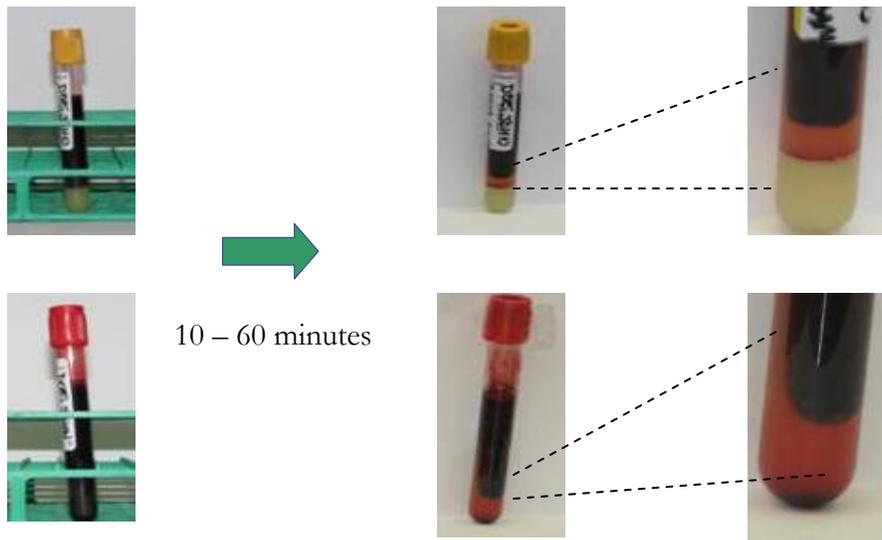
PPE FOR THE SERUM SEPARATION PROTOCOL

When working with blood specimens, appropriate PPE must be used for personal safety. The recommended PPE for separating serum from red-top or serum separator blood collection tubes includes: gloves, a lab coat, and face protection as appropriate for a potential splash hazard. Face protection could consist of a face shield or safety glasses.



THE CLOTTING PROCESS

- Clotting begins when a blood sample is collected from a patient into a red-top tube or serum separator tube (SST).
- A specimen collected in a blood collection tube with clot activator should be inverted five times to facilitate the clotting process.
- Allow the specimen(s) to sit at ambient temperature until a clot has formed. Typical clotting time is 10 minutes.
NOTE: Red-top tubes may require up to 60 minutes, while serum separator tubes (SST) may require up to 30 minutes
- Once a clot has formed, the specimen is ready for centrifugation.



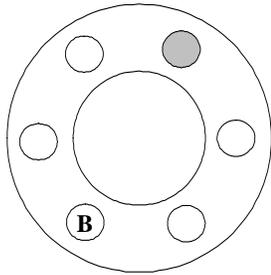
THE CENTRIFUGATION PROCESS

- Prior to centrifugation, the specimen tube should be re-examined for any hairline cracks that will cause the tube to break during the centrifugation process.
- When centrifuging specimens, it is very important to ensure that the centrifuge is properly balanced. Improper balancing can cause damage to the centrifuge, personnel, or specimens.
- Place the specimen(s) in the centrifuge being sure to balance the load properly. Tubes of the same type and size should be compared and matched according to similar fill volumes. If the number of specimens totals one or five, the use of additional “balance tubes” filled with water will be required. Refer to “Balancing the Centrifuge flip card for diagrams. Ensure the lid is tightly latched.
- The correct spinning conditions for centrifuging serum specimens is 1100-1300 rpm for 15 minutes. Most clinical blood centrifuges only spin at one speed so you will just need to turn the timer to 15 minutes to start the centrifuge.
- Once the spin time is complete, it is very important to allow the rotor to stop spinning completely before opening the centrifuge lid. Failure to follow these instructions could cause serious injury to personnel. Be conscious of any possible broken tubes. If breakage has occurred, refer to the “Safety Concerns” flip-cards for further instructions. If no tubes are broken or damaged, remove the intact specimen(s) from the centrifuge.

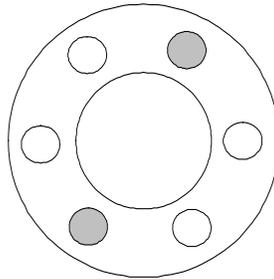


BALANCING THE CENTRIFUGE

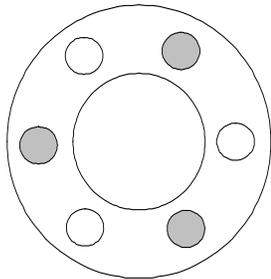
If the centrifuge holds a total of 6 tubes, balance the tubes in the following manner.



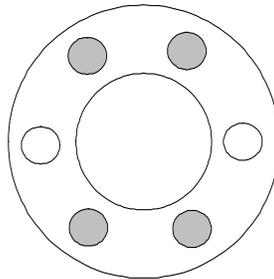
1 tube



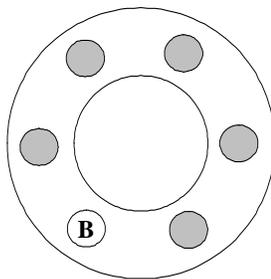
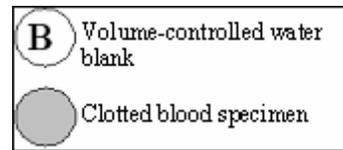
2 tubes



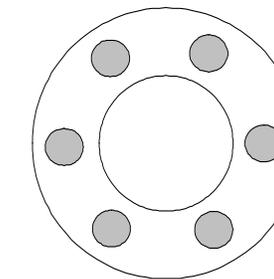
3 tubes



4 tubes



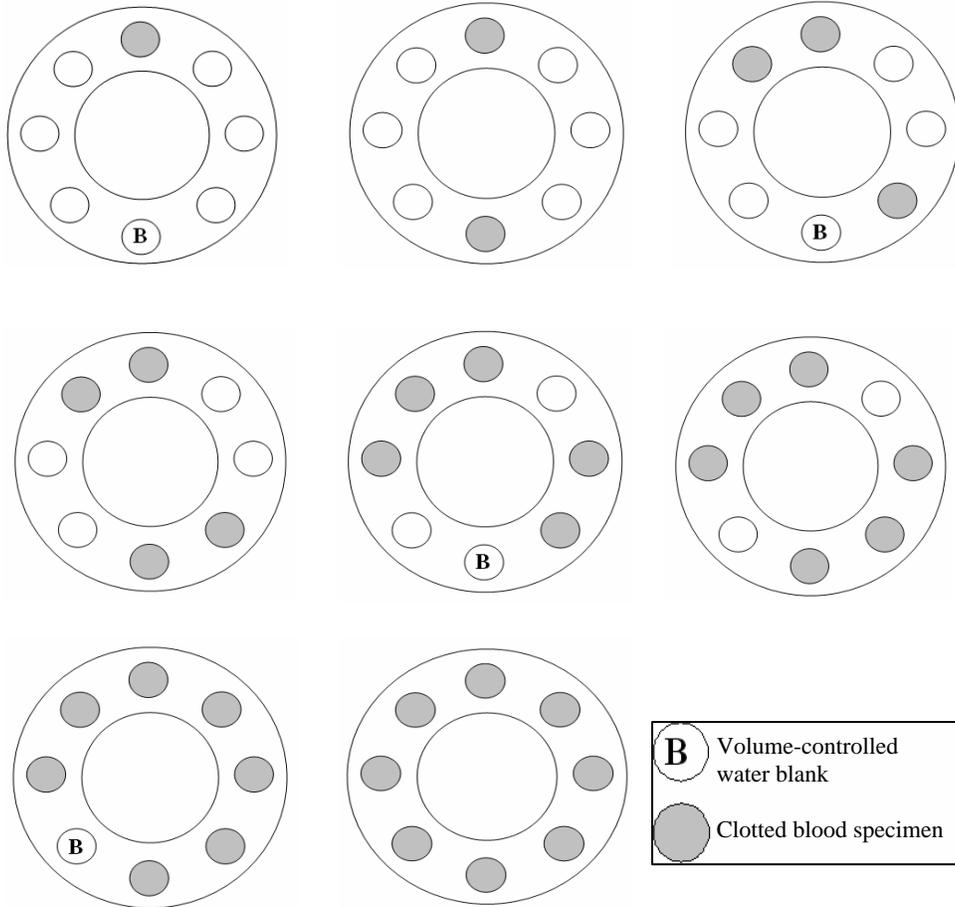
5 tubes



6 tubes

BALANCING THE CENTRIFUGE

If the centrifuge holds a total of 8 tubes, balance the tubes in the following manner.



THE SERUM SEPARATION PROCESS FOR RED-TOP TUBES

The following materials are required to perform the serum separation protocol:



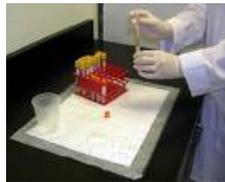
Tube rack



Transport container



Transfer pipette



Absorbent pad



PPE



Permanent marker



Biohazard bag/box



THE SERUM SEPARATION PROCESS FOR RED-TOP TUBES

- Assemble the required materials needed to perform the serum separation – test tube rack, transport container, transfer pipette, absorbent pad, label, permanent marker, biohazard container, and PPE.
- Label the transport container appropriately with the patient’s information. Be sure to use a permanent marker because other marker types can become smeared and unreadable.
- Wearing the appropriate PPE, remove the stopper from the red-top tube and place it on the absorbent pad.
- Using a transfer pipette, remove the serum from the red top tube being careful not to disturb the clot, and dispense it into the appropriately labeled transport tube.
- Cap the transport tube, ensuring that the cap is secure. Replace the stopper in the red top tube, and discard the tube and transfer pipette in the biohazard container.
- Pouring the specimen serum from the blood collection tube into a transport tube is discouraged for safety reasons.
- If collecting specimens in a serum separator tube (SST), the serum does not need to be transferred to a transport container after centrifugation. Please ensure that the fill volume adheres to the recommended instructions contained in the package insert.
- Place the labeled transport tube or centrifuged SST in a cooler or other cold storage device until ready for shipping.



SERUM SPECIMEN STORAGE, PACKAGING, AND SHIPPING

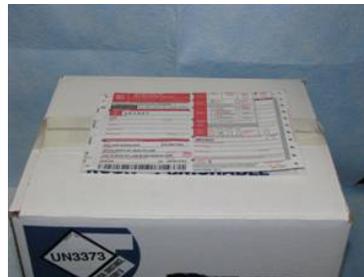
- When the specimens are ready to be shipped, remove the tubes from cold storage and, along with absorbent material sufficient to absorb tube contents, place into the plastic container provided with the shipping box. Place the plastic container into the shipping box and add at least two cold packs.

NOTE: Both cold packs must be cold or frozen before being placed into the cold shipping box.

- Place the styrofoam lid on the shipping box.
- Complete the appropriate specimen submission form for each specimen and place into the plastic bag.
- Ensure that the plastic bag containing the completed specimen submission forms is placed on top of the styrofoam lid before closing the box.
- Close the box securely and place the provided air bill in the sleeve located on top of the box.
- Ship specimens every day except on Friday, Saturday, Sunday, or the day before a federally observed holiday. Specimens must be shipped cold and received cold within 5 days of collection.



SERUM SPECIMEN STORAGE, PACKAGING, AND SHIPPING



Safety Concerns – Blood Spill

- When a spill occurs, immediately remove any contaminated PPE and place it in a biohazard container.
- Inform others in the immediate area about the spill and retrieve your spill kit.
- When cleaning up spills, individuals should wear two pairs of gloves, a lab coat, and a face shield or safety glasses.
- Place absorbent material (pads from the spill kit or paper towels) around the contaminated area so you will be less likely to contaminate your clothing while cleaning up the spill.
- Use a mechanical device such as tongs, forceps, or cardboard to pick up any broken tube pieces and place in a biohazard sharps container.
- Once you have removed all visible pieces of the blood tube, place additional absorbent material on the remaining contaminated area.
- Working from the perimeter inward, soak the absorbent material with an appropriate disinfectant solution such as a 10% bleach solution. Allow the disinfectant to remain in contact with the contaminated area for at least 15 minutes.
- After 15 minutes, use a mechanical device to pick up the disinfectant soaked material and place in a biohazard sharps container. Apply clean absorbent material to assist with removing any residual fluid and place in the biohazard container.
- Remove gloves and dispose of in the biohazard container. Also remove lab coat if contaminated and place in biohazard container or contaminated laundry container. Wash hands thoroughly or use hand sanitizer after removing PPE.



Safety Concerns – Centrifuge Spill

Clean-Up

- If a blood tube breaks during centrifugation, immediately unplug the centrifuge and allow the rotor to completely stop.
 - It is recommended that you allow 10 minutes, or 30 minutes for known hazardous material, for any aerosols that were generated to settle before cleaning up the spill.
- Inform others in the immediate area of the spill and don the proper PPE (double gloves, lab coat, and safety glasses or a face shield).
- Use a mechanical device to remove the tube top and any tube pieces into a biohazard sharps container. Then remove the tube adapter from the rotor, being careful not to spill the contents.
- Add an appropriate disinfectant solution such as a 10% bleach solution to the adapter and let sit for at least 15 minutes.
- After 15 minutes, pour the solution in the tube adapter onto absorbent material sufficient to absorb the fluid located within the biohazard sharps container.
- Place all contaminated absorbent material in the biohazard sharps container. Wash the tube adapter with disinfectant or soap and water.
- Remove gloves and dispose of in the biohazard container. Also remove lab coat if contaminated and place in biohazard container or contaminated laundry container.
- Wash hands thoroughly or use hand sanitizer after



Porta-fuge Operation

The Porta-fuge must be placed in the car seat holder and secured with the seat belt, as shown.



Insert the cigarette plug into the car's power outlet and flip on the power switch located at the bottom rear of the centrifuge.

Insert the appropriate tube adapter for the blood tube being spun. Refer to the 8-place balancing diagram for the appropriate tube configuration. Close the lid and ensure the latch is in place.

The Porta-fuge only spins at one speed so turn the timer to 15 minutes to begin the run. Ensure the centrifuge reaches maximum speed.



Once the run is complete, the sight glass on the top of the lid may be used to see when the rotor has completely stopped.



Porta-fuge Spill

- If a tube breaks in the centrifuge during the run, immediately flip the power switch off.
- Use the sight glass to determine when the rotor has completely stopped before opening the lid.
- If the inside of the centrifuge has not been contaminated by the spill, locate the broken tube by carefully lifting each blood tube out of the tube adapter.
- Once the tube adapter containing the broken tube has been identified, lift the tube adapter with the broken tube out of the rotor and place into a sealable, leak proof biohazard bag or biohazard sharps container for decontamination later. Check the remainder of the tubes and tube adapters for any contamination or broken tube pieces. Remove the opposite tube adapter from the rotor so the rotor is balanced and run completed.
- If the inside of the centrifuge has been contaminated by a broken tube, please refer to the centrifuge spill section of the flip cards for step by step instructions.

