

# Specimen Collection and Preparation

Laboratory test results are dependent on the quality of the specimen submitted. It is important that all specimens and request forms be properly labeled with the name of the patient, date of birth, collection date, time, original collector's initials, and the origin (source) of the specimen, when applicable. Specimens must have two patient identifiers (patient's name must be one of them); without these the specimen cannot be processed.

If there is any doubt or question regarding the type of specimen that should be collected, it is imperative that Sky Lakes Laboratory Services be called to clarify the order and specimen requirements.

## Blood Collection

Most laboratory tests are performed on anticoagulated whole blood, plasma, or serum. In general, specimens should be refrigerated until placed in the courier box for transport to the laboratory. Please see our individual test directory section for specific requirements. **Caution:** avoid hemolysis.

- **Plasma:** Draw a sufficient amount of blood with indicated anticoagulant to yield necessary plasma volume. Gently mix blood collection tube by inverting 8 to 10 times immediately after draw. If required, separate plasma from cells by centrifugation within 30 minutes.
- **Serum:** Draw a sufficient amount of blood to yield necessary serum volume. Invert serum gel and plain, red-top tubes 8 to 10 times. Allow blood to clot at ambient temperature; and then, separate serum from clot by centrifugation within 30 minutes.
- **Whole Blood:** Draw a sufficient amount of blood with indicated anticoagulant. Gently mix blood collection tube by inverting 8 to 10 times immediately after draw.

## Specimen Collection Tubes

The following is a list of tubes referred to in Sky Lakes Laboratory Services' specimen requirements:

- **Green-Top (Sodium Heparin) Tube:** This tube contains sodium heparin—used for collection of heparinized plasma or whole blood for special tests.  
**Note:** After tube has been filled with blood, gently invert tube 8 to 10 times in order to prevent coagulation.
- **Grey-Top (Potassium Oxalate/Sodium Fluoride) Tube:** This tube contains potassium oxalate as an anticoagulant and sodium fluoride as a preservative—used to preserve glucose in whole blood and for some special chemistry tests.

**Note:** After tube has been filled with blood, gently invert tube 8 to 10 times in order to prevent coagulation.

- **Lavender-Top (EDTA) Tube:** This tube contains EDTA as an anticoagulant—used for most hematological procedures.  
**Note:** After tube has been filled with blood, gently invert tube 8 to 10 times in order to prevent coagulation.
- **Light Blue-Top (Sodium Citrate) Tube:** This tube contains sodium citrate as an anticoagulant—used for drawing blood for coagulation studies.  
**Note:** It is imperative that tube be completely filled. The ratio of blood to anticoagulant is critical for valid results. Immediately after draw, invert tube 8 to 10 times in order to activate anticoagulant.
- **Red-Top Tube:** This is a plain tube containing no anticoagulant—used for collection of serum for selected chemistry tests.
- **Royal Blue-Top Tube:** There are two types of royal blue-top Monoject tubes— one with the anticoagulant EDTA and the other plain. These are used for collection of whole blood or serum for trace element analysis. Refer to individual metals in individual test listings to determine tube type necessary.
- **Serum Gel Tube:** This tube contains a clot activator and serum gel separator—used for various laboratory tests.  
**Note:** After tube has been filled with blood, gently invert tube 8 to 10 times to activate clotting. Let stand for 30 minutes before centrifuging for 10 minutes. If frozen serum is required, pour off serum into a plastic vial and freeze. **Do not** freeze tube.
- **Special Collection Tubes:** Some tests require specific tubes for proper analysis. Please contact Sky Lakes Laboratory Services prior to patient draw to obtain correct tubes for metal analysis or other tests as identified in individual test listings.
- **Yellow-Top (ACD) Tube:** This tube contains ACD—used for drawing whole blood for special tests.  
**Note:** After tube has been filled with blood, gently invert tube 8 to 10 times in order to prevent coagulation.

## Urine Collection

**24-Hour Urine Collections:** We provide 24-hour urine collection containers.

Use the following procedure for correct specimen collection and preparation.

Warn patient of presence of potentially hazardous preservatives in collection container. Some tests may require an acid be placed in the container before collection begins.

- Instruct patient to discard **first-morning** specimen and to record time of voiding. Patient should collect all subsequent voided urine for remainder of day and night. Collect **first-morning** specimen on day 2 at same time as noted on day 1.
- Mix well before aliquoting and provide total volume of 24-hour urine collection.

See Urine Preservatives in Special Instructions for multiple collections.

Random Collections: For routine analysis and microscopic evaluation, have patient void into a clean container. Specimen should be capped, labeled, and refrigerated until courier pickup time. A “clean-catch” or midstream specimen is preferred. Patient should first void a small amount of urine which is discarded. Some of the urine should then be collected in a clean container before voiding is completed.

Clean-Catch, Midstream Urine Collections: Use the following procedure for correct specimen collection and preparation:

- **Males**

- Prepare obstetrical towelettes by opening packages (do not remove towelettes until ready to use). Set towelettes and container so that they may be reached while urinating.
- Holding back foreskin with one hand, if necessary, use first towelette to wash end of penis. Discard first towelette in wastebasket.
- Continue holding back foreskin and gently rinse end of penis using second and third towelettes, discarding them in wastebasket when done.
- Continue holding back foreskin and begin to urinate into toilet.

- **Females**

- Prepare obstetrical towelettes by opening packages (do not remove towelettes until ready to use). Set towelettes and container so they may be reached while urinating.
- With two fingers of one hand, hold outer vaginal folds apart. With the other hand, gently wash vaginal area from front to back, using first towelette. After use, discard first towelette in wastebasket.

- Still holding outer vaginal folds open, rinse area from front to back using towelette #2, discard, and then repeat with towelette #3.
- Continue holding outer vaginal folds apart, begin to urinate into toilet. Lean slightly forward so that urine flows directly down without running along skin.
- After urinating a few teaspoons, place a sterile urine container under the stream of urine and collect the remaining urine in the container. Even 1/4 cup is an adequate specimen for testing. After finishing, tighten the cap of the container securely, and wash any spilled urine from the outside of the container

## **Microbiology-Blood Culture Collection**

Since media into which blood specimens are placed have been developed as enrichment broths to encourage multiplication of even 1 bacterium, it follows that these media will enhance growth of any stray contaminating bacterium such as normal inhabitants of human skin.

It is undesirable to draw blood through a vascular shunt or catheter, since these prosthetic devices may harbor colonizing bacteria that are not present in circulating blood of patient; and blood obtained through foreign material would yield false-positive results. It is also recommended to draw blood below an existing intravenous line, if possible, since blood above the line will be diluted with fluid being infused.

Adequate volume is the single most important factor in the laboratory detection of microbes in the blood stream. Drawing blood cultures before the fever spike is optimal for recovery; however, volume is more important than timing.

### **Adult Blood Culture Volumes**

Use 1 green-top BacT/Alert FA FAN Aerobic bottle and 1 pink-top BacT/Alert SN Anaerobic bottle. Split total volume of blood between aerobic bottle and anaerobic bottle. If total volume is <10 mL, put total volume in green-top aerobic bottle. **Do not** use pediatric bottles (yellow-top) on patients >3 years of age.

### **Pediatric Blood Culture Volumes**

- Neonates to 1 year: 0.5 to 1.5 mL per bottle. It is preferred that 1 mL be collected between 2 venipunctures. However, 1 venipuncture may only be possible. To be determined by the phlebotomist.
- Children 1 to 6 years old: 1 mL per year of age, divided between 2 blood cultures. For example, for a 4 year old child, draw 2 mL from 2 different sites for 2 different blood cultures with a total of 4 mL.
- Children weighing 30 to 80 pounds: 10 to 20 mL divided between 2 blood cultures.
- Children and adults weighing >80 pounds: 30 to 40 mL divided between 2 blood cultures. At least 20 to 30 mL in 2 to 3 draws is the minimal requirement.

### **Preparation of Patient and Collection of Blood**

- Choose vein to be drawn by touching skin before it has been disinfected.
- Skin Preparation-adults and children >2 months of age:
  - Chloraprep is indicated for adults and infants. Pinch the Chloraprep vial and hold the applicator with sponge downward and gently squeeze wings, releasing solution for a controlled flow.
  - Press against skin and apply Chloraprep solution using a back-and-forth friction scrub for at least 30 seconds. Allow area to dry for approximately 30 seconds.
- Skin Preparation-infants <2 months of age:
  - Use Chloraprep wipes on infants <2 months of age. **Do not** use Betadine on this age group.
  - Press against skin and apply Chloraprep solution using a back-and-forth friction scrubbing for at least 30 seconds.
  - Allow area to dry for approximately 30 seconds.

While draw site is drying, remove caps from blood culture bottles. Wipe tops with a 70% alcohol wipe. Allow septum to air dry. Blood culture bottles must be at ambient temperature.

### **Venipuncture Device Collection Options**

- If using butterfly system, indicate a fill line on side of bottles. There are increment lines on sides of bottles. Fill bottles before filling any VACUTAINER tube. **Be careful not to overfill the bottles, as they do not stop drawing after a set amount.** Fill only to fill line.
- If using BacT/Alert Blood Collection System Adapter:
  - Connect adapter cap to luer connector of collection set.
  - Perform venipuncture. When needle is in the vein, secure it with tape or hold it in place.
  - Place adapter cap on aerobic BacT/Alert culture bottle septum. Press down to penetrate septum and obtain blood flow.
  - Verify that blood flows into bottle. Hold adapter cap down on bottle during collection.
  - After obtaining specified blood volume, move adapter cap from aerobic bottle to anaerobic bottle, and continue collection.
  - **Do not** remove needle from patient's arm during process. After blood collection is complete, remove adapter cap from culture bottle and then remove needle from patient's arm.
- If using a syringe, it is not necessary to change needle before inoculating blood in bottles.