

Specimen Collection

Blood Specimen

In order to obtain serum, plasma, or whole blood specimens, a sample of blood is drawn into color-coded tubes. Those tubes either allow or prevent the natural blood clotting process to occur.

Tubes containing preservatives or anticoagulants prevent clotting and provide either a plasma or whole blood specimen. Plain tubes or tubes containing a clot activator allow clotting to occur and provide a serum specimen after centrifugation.

Tubes with clot activator, a gel-like substance in bottom of tube, are called “serum separator” tubes or gold-top serum gel tubes. Generally, gold-top serum gel tubes are acceptable for most tests requiring serum unless specimen requirements for an individual test clearly states “Serum gel tube is not acceptable.”

Collection Procedures

- Specimens drawn into tubes with anticoagulants (eg, tubes with lavender, green, or blue tops) should be mixed thoroughly by gentle inversion 8 to 10 times. Avoid vigorous shaking, which can cause lysis or destruction of RBCs and inaccurate results for many tests. Place tube in refrigerator or leave at ambient temperature according to specimen requirements.
- Specimens drawn into tubes without preservatives (eg, tubes with red or red-mottled tops) should be allowed to clot at ambient temperature for 30 minutes before they are placed in refrigerator or otherwise treated according to specimen requirements. If a gold-top serum gel tube is used, mix gently by inversion 3 to 5 times immediately after drawing specimen.
- To ensure proper identification of specimens, label tube(s) immediately after draw. Clearly print patient’s first and last name on tube label, or affix a label to tube. If you have pre-printed bar code labels from a label printer that is part of the laboratory computer system, there is no need to write the patient’s name on label.

Color-Coded Tube Definitions

The following is a list of tubes referred to in Providence Alaska Medical Center’s (PAMC) specimen requirements:

- Gold-top Serum Gel Tube: This tube contains a clot activator and serum gel separator—used for various laboratory tests.
Note: Invert tube 3 to 5 times to activate clotting; let

stand for 30 minutes before centrifuging for 10 minutes. If frozen serum is required, pour off serum into plastic vial and freeze. **Do not freeze serum gel tubes.**

- Green-Top (Sodium or Lithium Heparin) Tube: This tube is used for drawing heparinized plasma or whole blood for special tests.
Note: After tube has been filled with blood, immediately invert tube 8 to 10 times to prevent clotting.
- Grey-Top (Potassium Oxalate/Sodium Fluoride) Tube: This tube is used for drawing plasma or whole blood and contains potassium oxalate as an anticoagulant and sodium fluoride as a preservative.
Note: After tube has been filled with blood, immediately invert tube 8 to 10 times to prevent clotting.
- Lavender-Top (EDTA) Tube: This tube is used for drawing plasma or whole blood and is used most often for hematological procedures and glycated hemoglobin analysis.
Note: After tube has been filled with blood, immediately invert tube 8 to 10 times to prevent clotting.
- Light Blue-Top (Sodium Citrate) Tube: This tube contains 3.2% sodium citrate as an anticoagulant—used for drawing plasma or whole blood for coagulation studies.
Note: It is imperative that tube be completely filled. Ratio of blood to anticoagulant is critical for valid prothrombin time results. Immediately after draw, invert tube 8 to 10 times in order to activate anticoagulant.
- Pink-Top (EDTA) Tube: This tube is used for drawing plasma for Blood Bank tests.
Note: After tube has been filled with blood, immediately invert tube 8 to 10 times to prevent clotting.
- Red-Top Tube: This is a plain tube containing no anticoagulant—used for drawing serum for selected chemistry tests as well as clotted blood for immunohematology.
- Royal Blue-Top Tube: There are 3 types of royal blue-top Monoject® tubes—1 with anticoagulant EDTA, 1 with heparin, and the other plain. These are used in drawing whole blood or plasma for trace element analysis. Refer to individual metals in individual test listings to determine tube type necessary.
- Yellow-Top (ACD) Tube: This tube contains acid citrate

dextrose (ACD)—used for drawing plasma or whole blood for special tests.

Order of Draw

When multiple tubes are drawn from a single patient, the additives can be transferred between tubes. To eliminate interference from these additives when testing is performed, please follow the order of draw listed below. If a blue-top tube is drawn for coagulation studies, never draw it first because thromboplastin from the venipuncture site may invalidate the test. If a blue-top tube is the only tube drawn, a 5-mL discard tube should be drawn first.

Order of Draw	
VACUTAINER® System	Syringe
1. Blood culture	1. Blood culture
2. Chemistry (non-additive, plain, or gold-top serum gel tube)	2. Blue-top (sodium citrate) tube
3. Blue-top (sodium citrate) tube	3. Pink-top (EDTA) tube (Blood Bank)
4. Green-top (heparin) tube	4. Lavender-top (EDTA) tube
5. Pink-top (EDTA) tube (Blood Bank)	5. Chemistry (non-additive, plain, or gold-top serum gel tube)
6. Lavender-top (EDTA) tube	6. Green-top (heparin) tube
7. Grey-top (potassium oxalate/sodium fluoride) tube	7. Grey-top (potassium oxalate/sodium fluoride) tube
8. Yellow-top (ACD) tube	8. Yellow-top (ACD) tube