QUICK GUIDE

CLSI H21-Ed6-QG

Collection, Handling, Transport, and Storage for Hemostasis

NOTE: Standard precautions should be followed at all times.

Methods for Obtaining Blood

Venipuncture

- Generally, the preferred method is to collect blood specimens by venipuncture directly into a tube containing the anticoagulant.
- For proper venipuncture technique, see CLSI PRE02.[1]
- All specimens should be collected in a container with a nonactivating surface.

Collection With Syringe

A small-volume syringe (≤ 20 mL) is recommended. Appropriate safety procedures should be used to remove the needle.

Blood must be added to the appropriate volume of anticoagulant within one minute of draw completion and mixed immediately.

- Regardless of the device used for specimen collection, all tubes must be gently inverted per the manufacturer's instructions to mix.
- Excessive mixing can cause hemolysis and/or platelet activation, leading to erroneous results.

Vascular Access Device

Under certain circumstances, blood specimens for coagulation testing may be drawn from a vascular access device (VAD) using a blood collection system or a syringe.

- In this case, the line should be flushed with 5 mL of saline, and the first 5 mL of blood or six dead-space volumes of the VAD should be discarded.

Additional Recommendations

- Blue top tubes (ie, sodium citrate) for routine coagulation studies can be the first tube or only tube drawn.
- Proof of necessity of drawing a discard tube for other coagulation testing is circumstantial at best, but there are no current published data to suggest that this practice is necessary.
- When a winged blood collection set is used, a discard tube must be drawn first. (The discard tube must be used to fill the blood collection tubing dead space.) The discard tube must be a nonadditive or a 3.2% citrate tube.

Additionally, because of their longer path length between vein and anticoagulant, winged blood collection sets should be used with caution when used in combination with smaller-gauge needles to avoid platelet and coagulation activation.

Anticoagulant

- The recommended anticoagulant should be 3.2% trisodium citrate, buffered or unbuffered, although 3.8% may be acceptable if appropriate verification has been performed.
- Other anticoagulants (eg, oxalate, heparin, or EDTA) are unacceptable.

Blood Anticoagulant Ratio

- The proportion of whole blood to the liquid sodium citrate dihydrate anticoagulant volume is 9:1.
- Inadequate filling of the collection device will decrease this ratio and can lead to inaccurate results.

Criteria for Rejection

- Specimens that are clotted, collected in the wrong anticoagulant, or are in collection devices that have less than the recommended fill are not suitable for testing and should be rejected.
- The whole blood specimen should be checked for clot formation by gentle inversion and observation, and clotted samples should be rejected.
- Specimens that have visible hemolysis should not be used because of possible clotting factor activation and end-point measurement interference.

Some current instruments using an optical detector might have problems with end-point determinations on samples that are icteric, lipemic, or contain substances that interfere with light transmission. Alternative methods (eg, mechanical or electromechanical) should be considered.

Preparation of Suitable Plasma Specimens

- Laboratories should have a single validated process that ensures preparation of platelet-poor plasma (platelet count < 10×10^9/L) (10 000/µL).
- The reliability of the centrifugation procedure should be verified at least annually or after modification of the centrifuge to ensure plasma platelet counts are within acceptable limits.

Source Document: CLSI H21 | *Collection, Transport, and Processing of Blood Specimens for Testing Plasma-Based Coagulation Assays, 6th Edition, 2024*