

Tip of the Month



How to Hemolyze a Blood Sample

According to a popular song of the 1960s, breaking up is hard to do. But not if you're a red blood cell. Just ask any of the trillions of RBCs coursing through the veins of your patients. When blood samples are mishandled during collection or processing, breaking up is one of the *first* things on their minds.

Hemolysis is the most common reason blood samples are rejected by testing facilities, and it's rarely caused by the laboratory after the sample is received. Not only will RBCs break apart with the slightest deviation in blood collection technique, they then spill their guts in the form of hemoglobin into surrounding plasma for the entire laboratory world to see. Because hemolysis greatly impacts the accuracy of many laboratory tests, those who collect and handle blood samples must know what causes hemolysis and work to prevent it. Here's how to tell if the RBCs in the patient samples you collect are headed for a "break-up":

- The vein selected is small or fragile;
- You use small bore needles (i.e., 25-gauge) or combine a small needle with a large evacuated tube;
- The bevel of the needle is partially occluded within the vein resulting in a slow draw;
- You draw through an existing hematoma;
- You apply excessive force while pulling back on the syringe plunger;
- Frothing of sample occurs during collection due to inappropriate equipment assembly (i.e., loose connection between needle and syringe, etc.);
- Tourniquet application exceeds one minute;
- You forcibly fill evacuated tubes with a syringe;
- Filled tubes are vigorously mixed or shaken;
- You excessively squeeze or "milk" capillary sites;
- The sample is collected during an IV start or through a vascular access device;
- Horizontal positioning of tubes during transportation that allows excessive agitation;
- Blood samples are exposed to temperature extremes;
- The pneumatic tube system used lacks adequate shock absorbers;
- Samples are improperly or excessively centrifuged;
- You allow the blood entering the tube to strike full-force on the bottom of the tube;
- You rim serum tubes to remove fibrin clots.

Sure, RBCs are high maintenance. But the heartbreak of hemolysis isn't inevitable. Want to maintain a viable relationship with your patients on a cellular level? Knowing the preanalytic causes of hemolysis, along with a little TLC—tender, loving, collection—goes a long way.