Hematology Sample Collection and Handling

Sample Collection Steps

Correct sample processing is the most important step in obtaining accurate results on an automated hematology system. Most analytical errors are caused by improper sample collection and handling. In particular, microclot formation should be avoided. Microclots cause falsely decreased platelet counts and lowered WBC counts due to cell trapping (see photo at left). They may also cause obstructions in the analyzer requiring maintenance. Figure 1

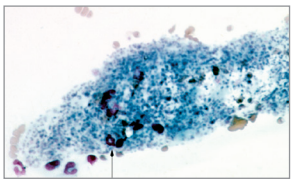
Figure 1

The following protocol will assist in minimizing microclot formation and obtaining the highest quality samples possible.

Swift, atraumatic venipuncture is critical to proper sample handling. Figure 2

- Use a 22–gauge or larger size needle to minimize hemolysis.
- To prevent microclot formation, avoid repositioning and/or excessive suction on the syringe.

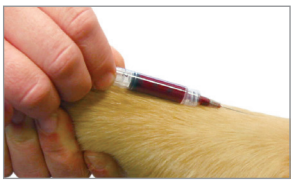
Figure 2

Immediately transfer blood into a purple-top (EDTA) collection tube by one of two following methods. Figure 3

- Remove needle from syringe and remove stopper from the tube. Hold the top of the syringe over tube and gently dispense the blood into tube. Fill tube ½–¾ full then recap; OR
- Push needle through stopper and allow the vacuum to aspirate blood into the tube. Do not press on syringe plunger! This will cause hemolysis.


Figure3

NOTE: If you are collecting blood for both hematology and chemistry (green top tube), fill the green top tube first and then fill the purple top tube and mix well. Avoid cross contamination of the EDTA anticoagulant with the chemistry tube.

Immediately invert tube 8–10 times to mix blood and anticoagulant. If testing is delayed, mix sample again immediately before analysis. Figure 4


Figure 4

Allow sample to stabilize for at least 1–2 min. before analysis. Figure 5

- Blood cells require this short period of incubation following placement into EDTA.
- It is recommended that the blood tube be placed on a mixing device for this interval. If blood is not mixed in this manner, manually and gently mix the sample immediately before analysis.

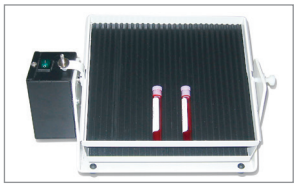
Figure 5

Check sample for microclots or fibrin using the following steps. Figure 6

- Immerse two wooden applicator sticks into blood and swirl gently.
- Remove sticks and examine for microclots (small dark red or white translucent particles) or fibrin.
- If clots or fibrin are present, discard sample and redraw. Clots will alter results and cause obstructions in the analyzer.

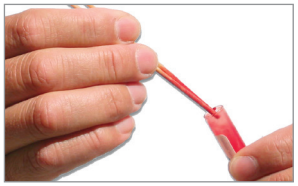
Figure 6