Proper Blood Smear Preparation

Texas A&M TVMDL Veterinary Medical Diagnostic Laboratory

Although there have been substantial advances in benchtop hematology instrumentation for veterinary species, manual evaluation of a blood smear remains a vital part of a complete blood count (CBC). At the Texas A&M Veterinary Medical Diagnostic Laboratory (TVMDL), all CBCs include manual blood smear examination by a highly skilled clinical pathology technician, a clinical pathologist, or both. Ideally, blood smear evaluation should be performed on a properly prepared blood smear to improve the assessment of all cell lines. Freshly prepared blood smears should be submitted with all EDTA blood for CBC tests.

Blood smear evaluation can help confirm platelet and white blood cell counts, identify infectious agents, and characterize the morphology of all cell lines. Instrumentation lacks the ability to detect infectious agents, neoplastic cells, and certain morphology changes. In addition, certain organisms (i.e. *Mycoplasma felis*, previously known as *Hemobartonella felis*) can fall off red blood cells during transit to a diagnostic lab with prolonged contact with EDTA.

Prepare a proper blood smear

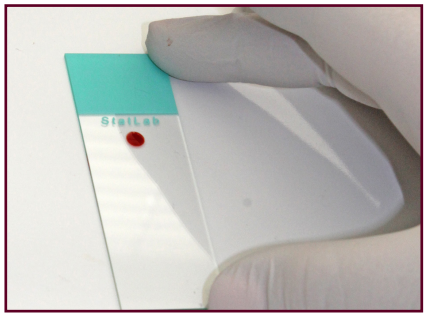
There are multiple methods to prepare a blood smear. Each person may have their own preference/ methods for success. When first learning, try multiple methods to determine which process works best for you. Blood smears are made using fresh blood or EDTA blood.

Step 1 ————

Using lens paper, gently wipe two glass slides to remove any dust or glass fragments. Place the glass slides on an even surface.

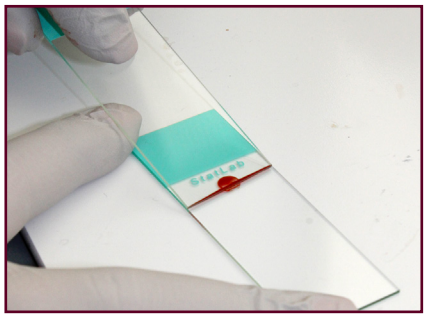
Step 2 ————

Mix blood thoroughly (if not a fresh sample). Place a small drop of blood on one end of one glass slide. Hold the top and bottom edges of the slide with the thumb of your non-dominant hand.



Step 3 ————

Using your dominant hand, place the edge of the other slide at an approximately 35-45^0 angle on the first glass slide, in front of the blood drop. Using gentle pressure, gently pull the second slide back into the blood drop and allow the blood to spread to the edge of the slide.

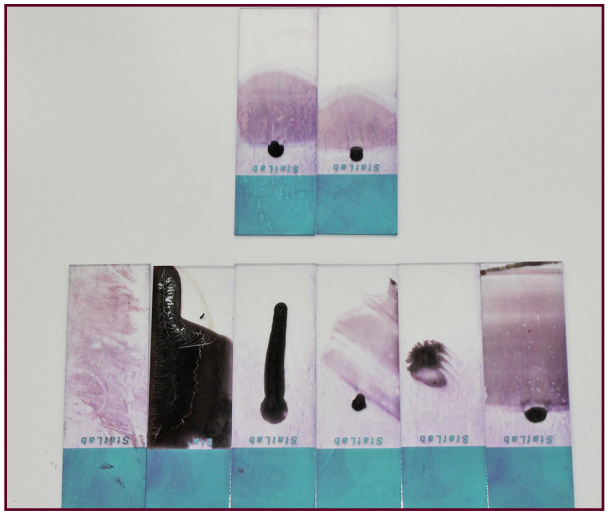


Step 4 ————

To spread the blood, rapidly but gently push the top slide forward through the remainder of the slide. It is important to keep gentle, equal pressure throughout the whole process, and do not lift the top slide before it reaches the edge of the bottom slide. A feathered edge should be present.

The top two slides are examples of proper blood smears.

The bottom row displays poorly prepared blood smears.



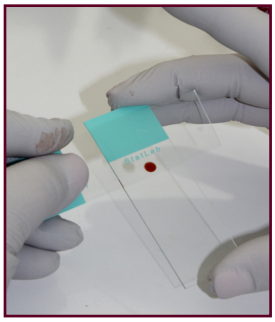
Step 5 ————

After preparation, the smear should be labeled and dried (air dryer or waving method).

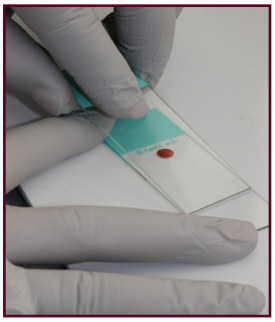
Blood smears can be examined by trained veterinary technicians, veterinarians, or sent to a diagnostic laboratory with whole blood. When sending blood smears, ensure they are protected from formalin and cold packs. Blood smears should not be refrigerated since warming to room temperature can cause condensation and cell lysis.

Alternative methods

Pull vs Push



Holding vs Counter



Troubleshooting

Problem	Fix
Too thick or too short	Try decreasing the angle of the spreader slide or decreasing the size of the initial blood drop.
Too thin or too long	Try increasing the angle of the spreader slide or decreasing the size of the initial blood drop.
Streaking	Try cleaning the edge of the spreader slide.