Blood Film Preparation and Common Problems

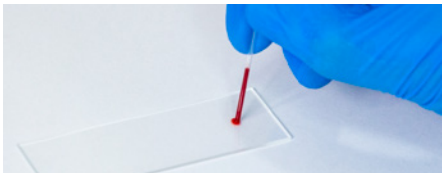
Blood Film Preparation

Required supplies

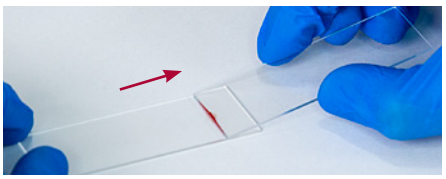
- 2 glass slides
- Plain capillary tubes, wooden applicators
- EDTA anticoagulated blood sample (purple top tube)

Procedure

1. Place one slide on counter. The other slide will serve as the pusher slide. Use a plain capillary tube or wooden applicator to dispense EDTA anticoagulated whole blood. Place a small drop of blood on the slide. The drop should be about this size: ●



2. Hold the slide in place on the counter as the smear is made. Place the edge of the pusher slide just to the left of the drop of blood and form an angle of about 30 degrees.
3. Back the pusher slide into the drop of blood and allow the blood to spread along the edge of the slide.



4. Immediately push the angled slide forward. Use gentle pressure and a quick and steady push.

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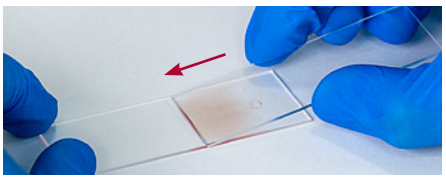
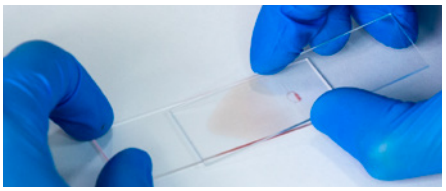
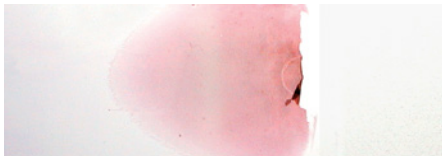


5. The smear should cover ½ to ¾ of the clear glass area of the slide. The end should be rounded and have a feathered edge, creating a thin area that has a rainbow-like appearance when reflected in light. The area just behind the feathered edge contains the monolayer of cells necessary to perform an accurate differential and assess cell morphology.

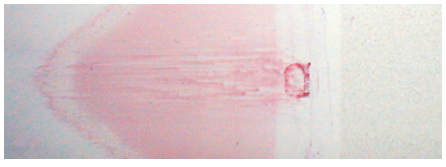


Example: Diagnostic quality blood film
Note the even appearance that gets thinner going to the left (feathered edge).



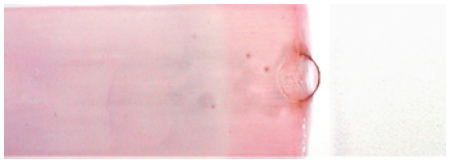
Common Problems in Blood Film Preparation

1. **Film too thin**
   Problem: Severe decrease in white blood cells and erythrocyte artifacts in monolayer.
   Cause: Motion of pusher slide too slow.
   Solution: Increase speed of pusher slide.



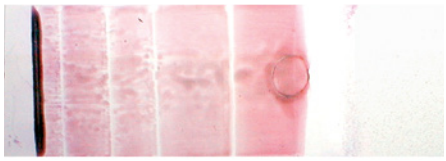
2. **Film too short**
   Problem: May be difficult to stain and examine.
   Causes: Drop of blood too small; angle of pusher slide is too upright.
   Solutions: Use a drop about this size: ●; decrease angle of pusher slide.

3. **Film runs off the end of slide**
   Problem: No monolayer present, too thick for viewing.
   Causes: Drop of blood too large; angle of pusher slide is too flat (too low).
   Solutions: Use smaller drop of blood; increase angle of pusher slide (more upright).



4. **Streaked, irregular film**
   Problem: Monolayer uneven, difficult to examine.
   Causes: Pusher slide had uneven or pitted edge; bottom slide is dirty; platelet clumps present in sample, especially a problem in cat samples; drop of blood allowed to partially dry before smear is made.
   Solutions: Use new slide; verify clumps by looking at stained film; make film immediately after placing drop of blood on slide.

5. **Marked skipping and variation in thickness**
   Problem: Monolayer irregular, difficult to examine.
   Causes: Too much pressure applied to pusher slide; slide pushed too slowly (pusher slide skips along bottom slide).
   Solutions: Apply gentle pressure while pushing forward. Pusher slide should rest on bottom slide; the pressure should be very gentle; push faster.



6. **Additional problems in blood smear preparation**
   Problem: Fixed smear and unable to apply appropriate differential staining.
   Causes: Exposure of slide to formalin vapors.

   Problem: Unknown slide sample.
   Causes: Failure to label slide with patient name and date.