The examination of a stained blood smear is part of the complete blood count (CBC). Stains are applied to blood smears so that red blood cells (RBCs), white blood cells (WBCs), and platelets can be microscopically viewed, identified, and evaluated, as explained in the blood cell morphology and WBC differential count lessons .

Collecting the Blood Specimen

The preferred specimen for blood smears is capillary blood that has no added anticoagulant. Capillary blood can be applied directly to the slide from the puncture site. smear can also be made from venous blood that has the anticoagulant EDTA added to it, provided the smear is prepared within 2 hours of blood collection.

Making the Smear

Tubes of anticoagulated blood must be mixed for at least 2 minutes by mechanical mixer or inverted gently 60 times immediately before the smear is made.

Two-Slide Method (Wedge Method)

The blood smear is prepared by:

1- placing a small drop of well mixed blood about from the right end

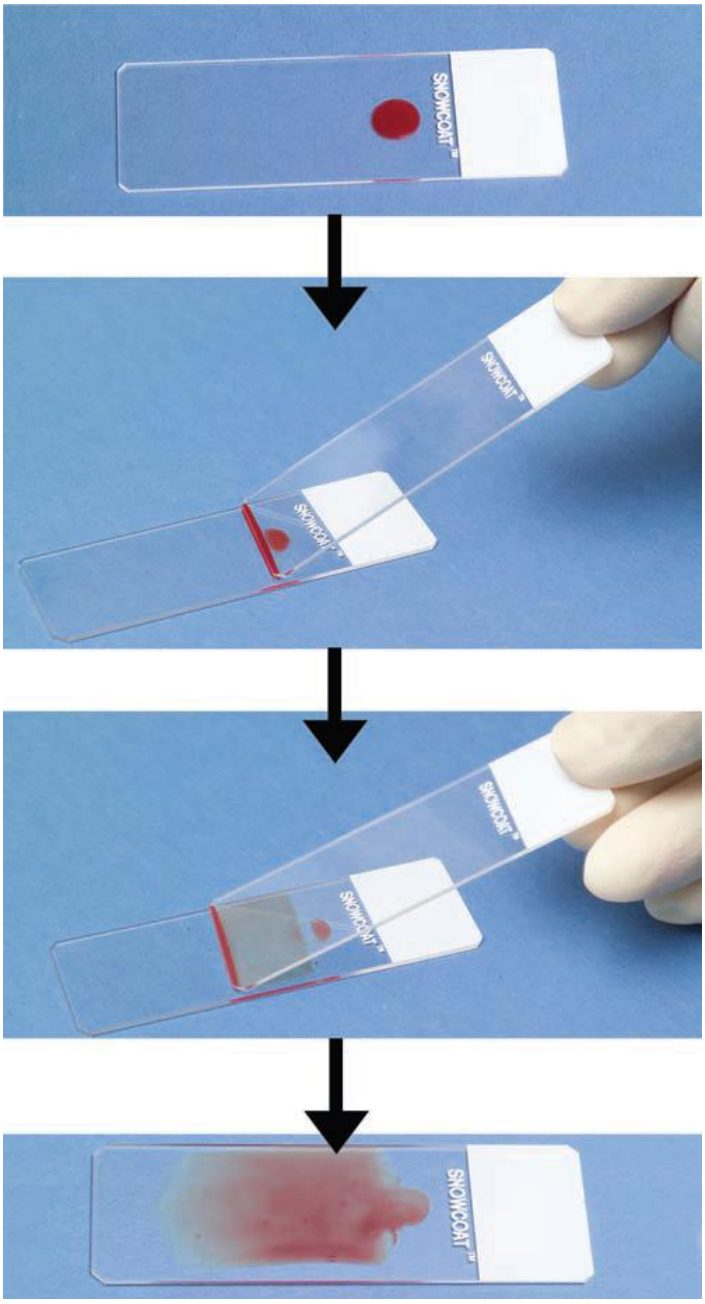
2- slide placed on a flat surface.

3- The end of a "spreader" slide is brought to rest at a 30- to 35-degree angle in front of the drop of blood and is then brought back into the drop of blood until the drop spreads along three-quarters of the edge of the spreader slide .

4-As soon as the blood spreads along the edge of the spreader, the spreader is lightly pushed to the left with a quick, steady motion (avoiding pressure on the slide) to spread the blood into a thin film.

5- The smear is placed in a slide-drying rack and allowed to air-dry as quickly as possible.

6- Dried slides are ready for Staining or preserving.



Preserving the Smear

If a dried smear cannot be stained immediately, it should be Preserved by immersing in methanol for 30 to 60 seconds and then air-dried. The methanol is a **fixative**, or preservative, that prevents changes or deterioration of the cellular components. Slides preserved in this way can be stained at a later time.

Features of a Good Blood Smear

A well-prepared smear cover about three-fourths of the slide and should show a gradual transition from thick to thin. It should have a smooth appearance, with no holes or ridges, and a feathered edge (about 1.5 cm long) at the thin end of the smear. When the smear is examined microscopically, the cells should be evenly distributed, with an area at the thin end of the smear where RBCs are not overlapping.

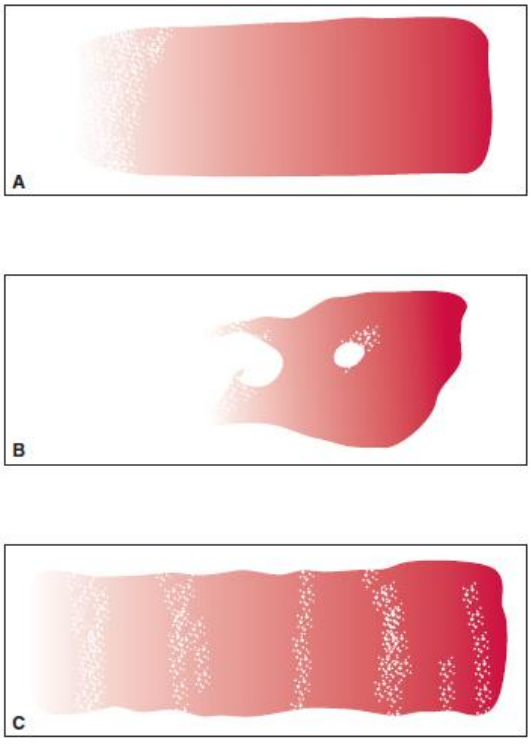


FIGURE 2-46 Properly prepared smear (A) versus improperly prepared smears (B and C)

Factors Affecting Blood Smear Quality

Several factors can affect the quality of the blood smear. The length and thickness of the smear are affected by:

- The size of the drop of blood
- The angle of the spreader slide
- The speed at which the smear is made

STAINING A BLOOD SMEAR

The **Wright's stain** used for the routine microscopic examination of blood is a **polychromatic** stain. It contains a combination of **methylene blue**, a basic dye that gives a blue color to stained structures **eosin**, an acid dye that gives a red-orange color to stained structures and methanol, a fixative.

Two commonly used blood stains are **Wright's stain** and **Giemsa stain**.

Staining procedure : Thin Film staining

1. On a clean dry microscopic glass slide, make a thin film of the specimen (blood) and leave to air dry.
2. dip the smear (2-3 dips) into pure methanol for fixation of the smear, leave to air dry for 30seconds
3. Flood the slide with 5% Giemsa stain solution for 20-30 minutes.
4. Flush with tap water and leave to dry