

Blood Smear Preparation

Aim of blood smear:-

- Examination of thin blood films is important in the investigation and management of anaemia, infections, and other conditions which produce changes in the appearance of blood cells and differential white cell count.
- A blood film report can provide rapidly and at low cost, useful information about a patient's condition.

Making blood films:- Three basic steps to make blood film:-

1. Preparation of blood smear.
2. Fixation of blood smear.
3. Staining of blood smear.

Blood Smear Preparation

Methods may be used to make blood smears:

1. The cover glass smear.
2. The wedge smear.

WEDGE BLOOD SMEAR

• Specimen:-

- Peripheral blood smear made from EDTA-anticoagulated blood.
- Smears should be made within 1 hour of blood collection from EDTA specimens stored at room temperature to avoid distortion of cell morphology.
- Blood smears can also be made from finger stick blood directly onto slide.

• **Equipment:-**

- Spreaders.
- Clean slides.
- Blood capillary tube or micropipette $10\ \mu\text{L}$.

Procedure:-

1. **Fill a capillary tube three-quarter full with the anticoagulated specimen.**
2. **Place a drop of blood, about 2 mm in diameter approximately an inch from the frosted area of the slide.**
3. **Place the slide on a flat surface, and hold the narrow side of the non frosted edge between your left thumb and forefinger.**
4. **With your right hand, place the smooth clean edge of a second (spreader) slide on the specimen slide, just in front of the blood drop.**
5. **Allow the blood to spread almost to the edges of the slide.**
6. **Push the spread forward with one light, smooth, and fluid motion. A thin film of blood in the shape of a bullet with a feathered edge will remain on the slide.**
7. **Label the frosted edge with patient name, ID# and date.**
8. **Allow the blood film to air-dry completely before staining. (Do not blow to dry. The moisture from your breath will cause RBC artifact).**
9. **Hold the spreader slide at a 30° angle, and draw it back against the drop of blood The shape of blood film.**

Characteristics of A Good Smear:-

1. **A good blood film preparation will be thick at the drop end and thin at the opposite end.**

2. **The blood smear should occupy the central portion of the slide.**
3. **The blood smear should not touch the edges. except for point of application.**
4. **Should be margin free.**

Procedure notes:-

1. As soon as the drop of blood is placed on the glass slide, the smear should be made without delay. Any delay results in an abnormal distribution of the white blood cells, with many of the large white cells accumulating at the thin edge of the smear.

The thickness of the spread when pulling

Is determined by:

1. The angle of the spreader slide. (the greater the angle, the thicker and shorter the smear).
2. Size of the blood drop.
3. Speed of spreading

The thickness of the spread notes:-

1. **If the *hematocrit is increased*, the angle of the *spreader slide* should be *decreased*.**
2. **If the *hematocrit is decreased*, the angle of the *spreader slide* should be *increased*.**

The thickness of the spread notes

Common causes of a poor blood smear

1. Drop of blood too large or too small.
2. Spreader slide pushed across the slide in a jerky manner.

3. Failure to keep the entire edge of the spreader slide against the slide while making the smear.
4. Failure to keep the spreader slide at a 30° angle with the slide.

Comment

- Although this is the easiest and most popular methods for producing a blood smear, it does not produce a quality smear.
 - The WBCs are unevenly distributed and RBC distortion is seen at the edges
 - Smaller WBCs such as lymphocytes tend to reside in the middle of the feathered edge.
 - Large cells such as monocytes, immature cells and abnormal cells can be found in the outer limits of this area.