

Differential leukocyte count (DLC)

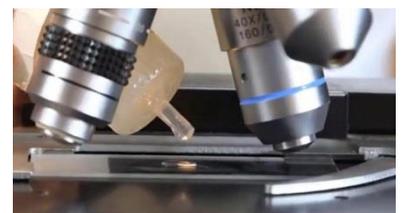
It is white blood cell count for each type separately to determine the ratio of each type, the importance of this test:

- 1-Confirm automatic examination of allergic infections.
- 2-Diagnosis of malignant blood disorder.
- 3-Recognized myeloid precursor.

Two methods in this test 1-automatic by hematology analyzer
2-manual depend on blood film.

Procedure of manual method:

- 1- Preparing the blood film by using Giemza or Leishman stain.
- 2- Choosing the field of test so that it is monolayer.
- 3- Microscopic examination (40X then by oil lens) and record the number of all WBC types that observed.



place a small drop of immersion oil

Procedures of Leishman's method:

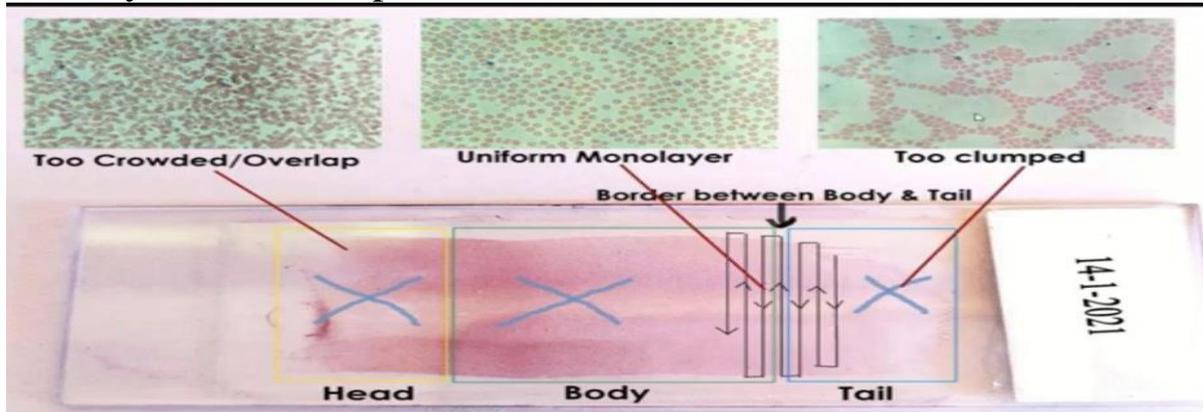
- 1- Place drop of blood on dried slide.
- 2- Spreading it with another slide (blood film method).
- 3- Allow to stain for 2-3 min.
- 4- Wash gently in a stream of buffered water until it has acquired a pinkish tinge (up to 2 min).



- 5- Clean under side of the slide and leave to dry upright.
- 6- Slide is ready to study under microscope.

Note: The edge of the spreader should be very smooth, and narrow than that of the slide. The spreader must be cleaned and dried if it had been used for spreading more than five films.

Chosen the area between the tail and body of blood film, where the neutrophil is concentrated in the edges of the slide, and the lymphocyte remains in the center of the slide, while we notice the monocyte and eosinophil are scattered in the film.



Count cells by battlement pattern

Count on the table design, and calculate 100 different white blood cells, then we extract the percentage (**relative count**) for each type of cell, after that calculate the (**absolute count**) based on the equation:

Table Design 2

N	L	M	L	E					

Symbols to be used:

- 'M' for Monocyte
- 'L' for Lymphocyte
- 'E' for Eosinophil
- 'B' for Basophil
- 'N' for Neutrophil

Fill these Symbols accordingly in the 100 squares on the left

Table design for differential leukocyte count

$$\text{Absolute count of any leukocyte type} = \frac{\text{Relative count of this type} \times \text{total WBC count}}{100}$$

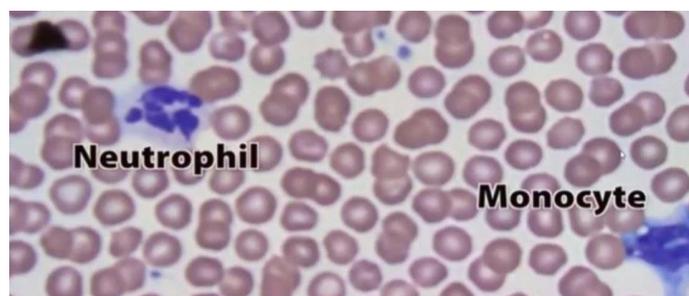
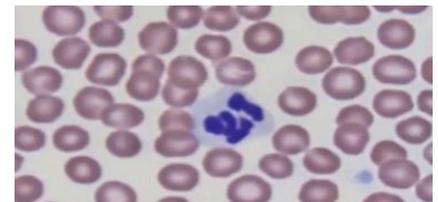
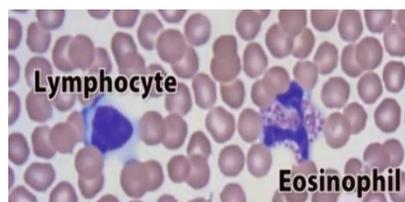
The dependence on the diagnosis using **absolute count** because it shows the decrease and increase in the number of cells accurately compared to the relative count.

Reference range:

Total WBC count: $4.0-11.0 \times 10^9 / L$.

Differential WBC count

Count type Cell type	Absolute	Relative
Neutrophils	$2.0 - 7.0 \times 10^9$	40 -80 %
Lymphocytes	$1.0 - 3.0 \times 10^9$	20 - 40 %
Monocytes	$0.2 - 1.0 \times 10^9$	2 - 10 %
Eosinophils	$0.02 - 0.5 \times 10^9$	1 - 6 %
Basophils	$0.02 - 0.1 \times 10^9$	1 - 2%



DLC provide clues about illness:



- Neutrophilia: (pyogenic illness: bacterial or fungal infection)
- Eosinophilia allergic or parasite infection
- Basophilia: allergic and malignant
- Lymphocytosis: viral infection
- Monocytosis: chronic infection

References:

- 1-Laposata, M. (2014). *Laboratory Medicine Diagnosis of Disease in Clinical Laboratory 2/E*. McGraw-Hill Education.
- 2- Hoffbrand AV, Steensma DP. Hoffbrand's essential haematology. John Wiley and Sons; 2019 Dec 31.