

# Total and Differential Leucocytic Count (TLC and DLC)



# Objectives

- To be able to identify the different types of leucocytes under the microscope
- To practice the procedure for differential leucocyte counting.
- To know the normal values expected for the differential white cell count.
- To understand the use of the differential white cell count in the diagnosis of disease processes.



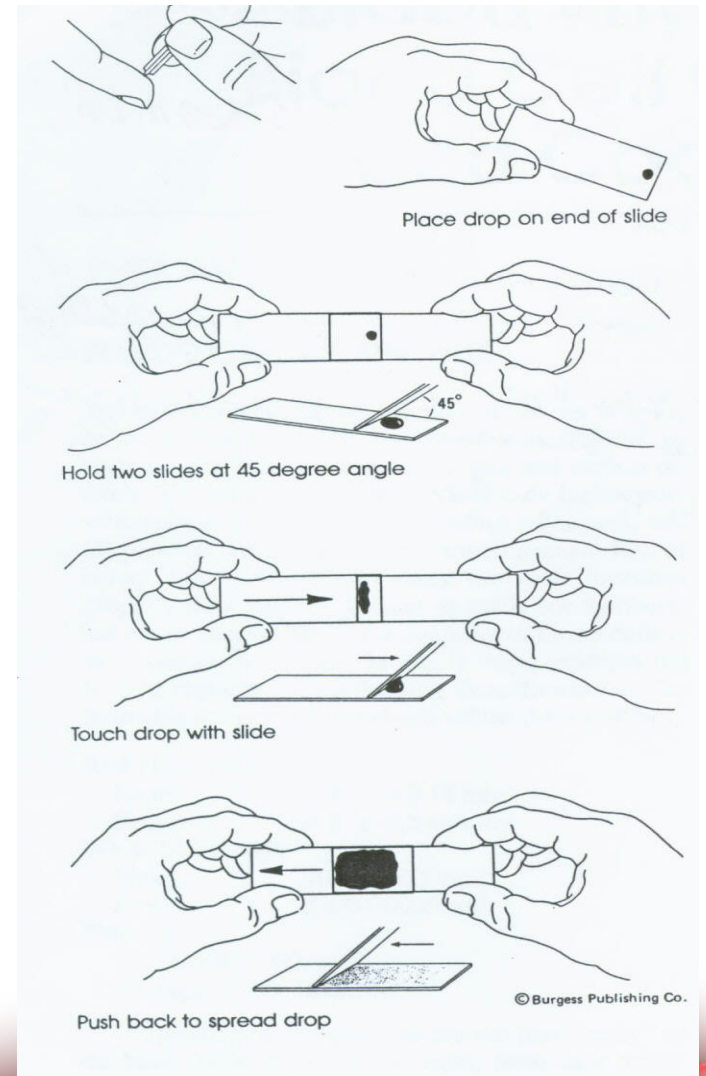
# Reagents and apparatus:

- A microscope with an oil immersion objectives.
- Mineral or cedar oil
- Various dyes for staining blood films (e.g., Wright's stain or Leishman's stain)
- Microscope slides.



# Procedure

- Prepare blood film and stain it with Wright's stain
- Examine it under the oil immersion objective lens of the microscope and identify the different leucocytes (count about 100 cells)



WBCs are classified into

**Granular :**

- Neutrophils
- Eosinophils
- Basophils

**Agranular:**

- Lymphocytes
- Monocytes

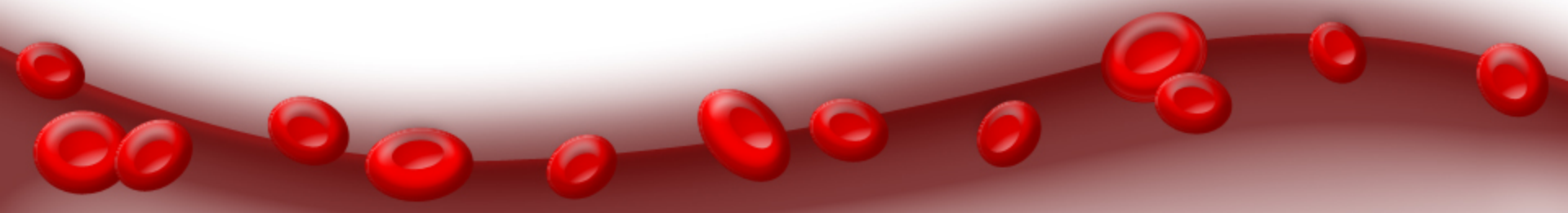
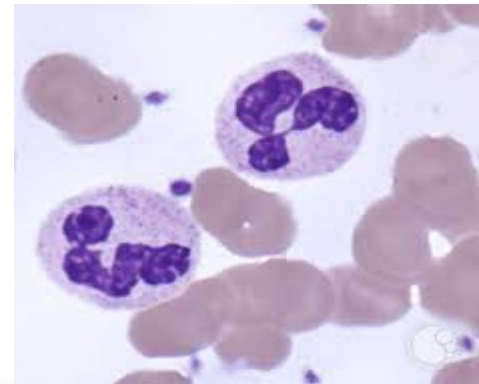


# Neutrophils

- Most common type of blood cells (50-70%)
- They have small cytoplasmic granules and a complex, multilobed nucleus.
- Their granules take a neutral (purple or pink) color with various stains such as Wright's stain.

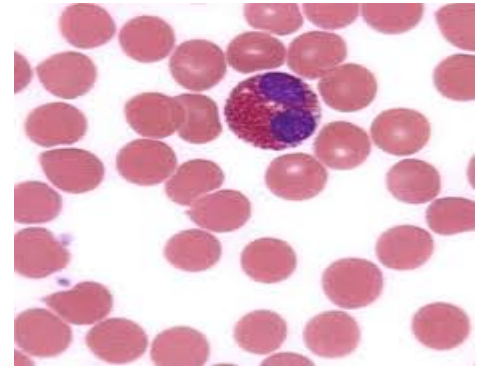
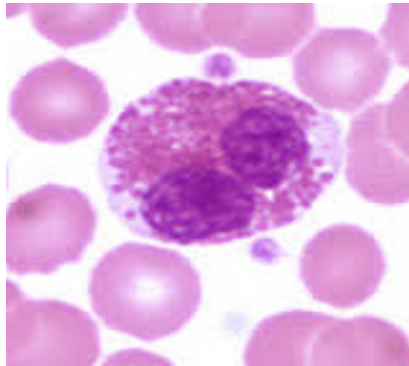
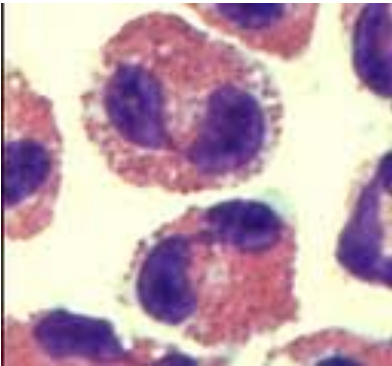


Erythrocytes and a neutrophil.  
Wright's (Oil)



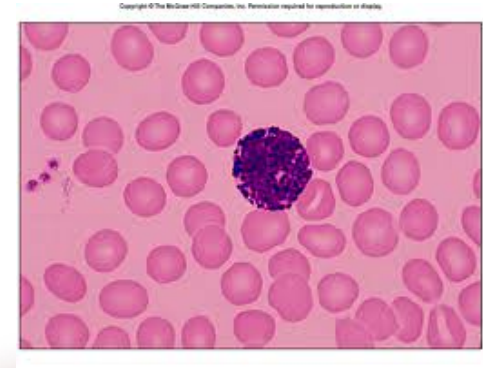
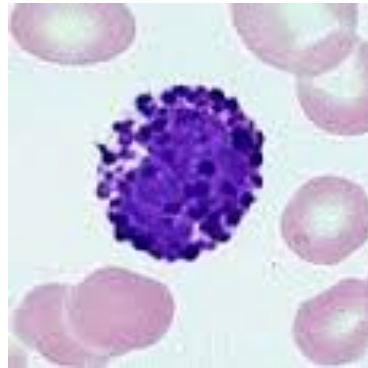
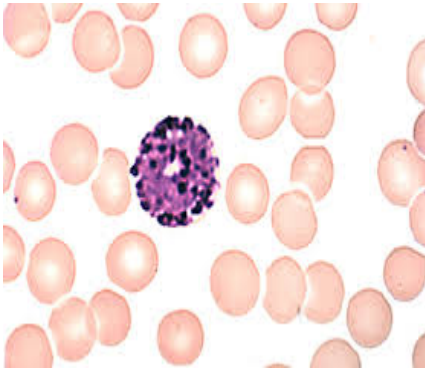
# Eosinophils

- Less common in the blood stream (1-3%)
- They are characterized by a dumbbell-shaped nucleus (bi-lobed) and large, prominent, red (eosinophilic) granules



# Basophils

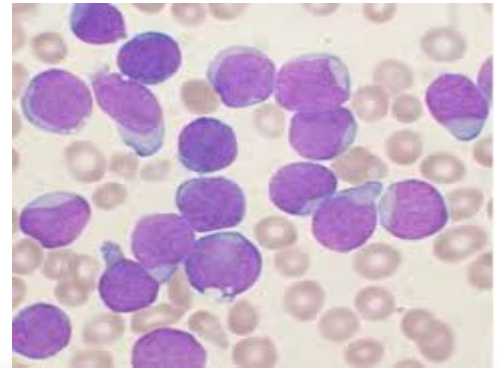
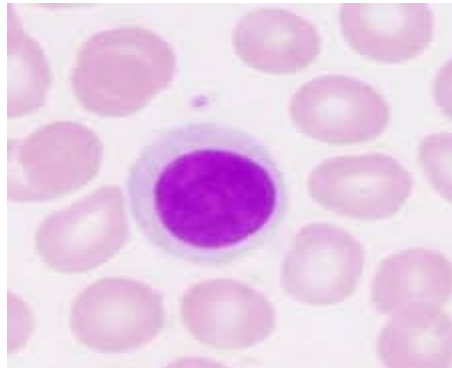
- The rarest of all blood cells (0.4-1%)
- It is a large cell filled with prominent blue (basophilic) granules. These large granules contain heparin and histamine. The nucleus is somewhat hidden behind these large granules.





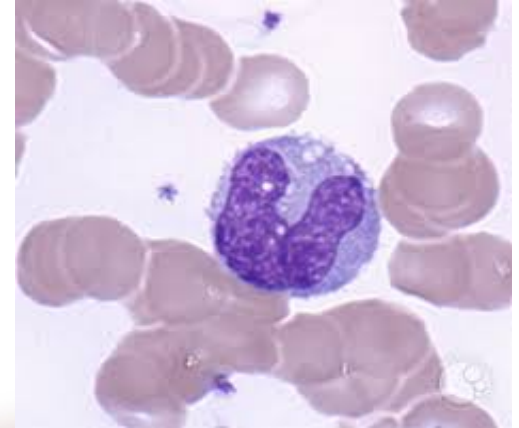
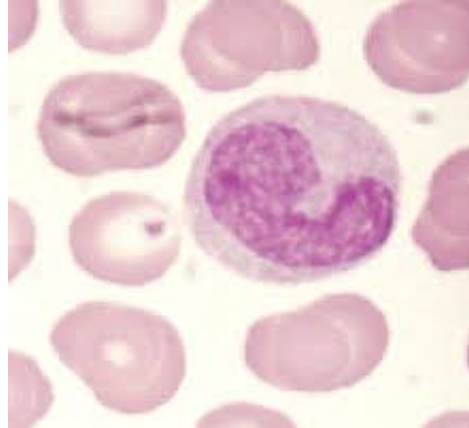
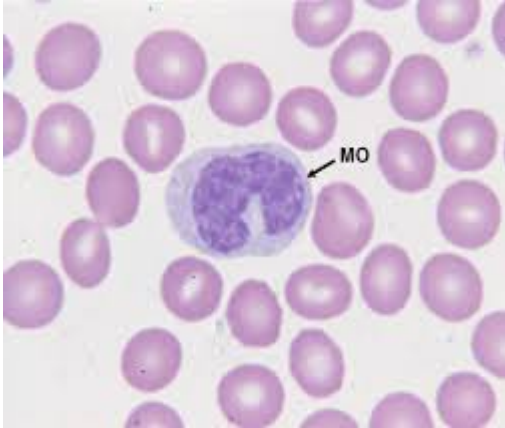
# Lymphocytes

- About 25-35% of the blood cells
- Small, spherical cells with large, round nucleus
- The cytoplasm does not contain any granules.
- The nucleus occupies most of the volume of the cell, leaving only a thin rim of the cytoplasm around it .



# Monocytes

- About 4-6% of the blood cells
- The largest of the blood cells, the cytoplasm has no granules
- The nucleus is large and kidney-shaped



# Clinical Application

Differential count provides clues about certain illnesses

1. **Neutrophilia:** pyogenic illness (bacterial or fungal infection)
2. **Eosinophilia:** Allergy and parasitic infections
3. **Basophilia :** in allergy and malignancy
4. **Lymphocytosis:** viral infections (infectious mononucleosis) and malignancies.
5. **Monocytosis :** chronic infections



<b>Blood element</b>	<b>% of leukocytes</b>	<b>Size <math>\mu</math></b>	<b>Cytoplasmic staining</b>	<b>Nucleus morphology</b>
<b>Erythrocyte</b>	<b>-</b>	<b>7-8</b>	<b>pink, no granules</b>	<b>none</b>
<b>Neutrophil</b>	<b>50-70</b>	<b>10-12</b>	<b>salmon-colored small granules</b>	<b>Segmented,-2-5 lobed</b>
<b>Lymphocyte</b>	<b>25-35</b>	<b>7-8</b>	<b>Light blue, scant amount, no granules</b>	<b>Single large Oval purple</b>
<b>Monocyte</b>	<b>4-6</b>	<b>16-18</b>	<b>Basophilic, no granules</b>	<b>Large, kidney shaped</b>
<b>Eosinophil</b>	<b>1-3</b>	<b>13-14</b>	<b>Bright red coarse granules</b>	<b>bilobed purplish</b>
<b>Basophil</b>	<b>0-4-1</b>	<b>14-15</b>	<b>Large, basophilic granules</b>	<b>Bilobed bluish black</b>

# Thank you

You don't have to be a doctor to save lives.



**Just donate blood.**

Do you know that just a pint of blood can save up to 3 lives?

Donating blood is safe. It's painless, simple, and noble.

