



leukocytes

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At the end of this presentation you will be able to:

1

Define leukocytes.

2

Discuss **The origin of leukocytes.**

3

Describe types and their function of leukocytes.

4

Discuss **common disorders that affect WBC.**

5

List How do I take care of my WBC.

INTRODUCTION:

Leukocytes (also called **white blood cells**) are a part of your immune system that protects your body from infection.

These cells circulate through your bloodstream and tissues to respond to injury or illness by attacking any **unknown organisms** that enter your body.

white blood cells account for only about **1%** of the total blood volume.

With life span of 13-20 days, after which they are destroyed in the lymphatic system.

Their normal count is 4,000 – 11,000 / cubic millimeter of blood.

They are round and irregular in shape.

The origin of leukocytes

- **white blood cells** are produced and derived from pluripotent cells in the bone marrow known as hematopoietic stem cells.

Leukocytes are found throughout the body, including the blood and lymphatic system.

- **Bone marrow**, which produces granulocytes, white blood cells. Lymphatic tissues circulating in the liver, spleen, and lymph nodes, and these tissues produce agranulocytic white blood cells.

LEUKOCYTES

AGRANULAR



Lymphocyte



Monocyte

GRANULAR



Eosinophil



Basophil



Neutrophil

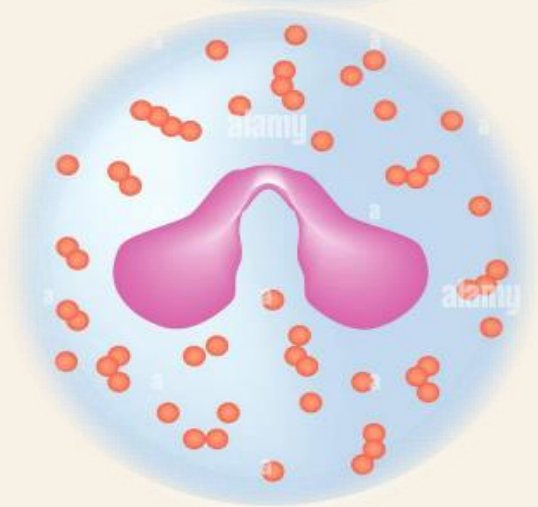
There are five types of white blood cells (leukocytes):

1- Neutrophils:

- . **Most numerous leukocytes in the body.**
- . Are twice as large as erythrocytes.
- . Using oxygen to produce hydrogen peroxides which kills bacteria.
- . Lifespan in blood: 7 hours.

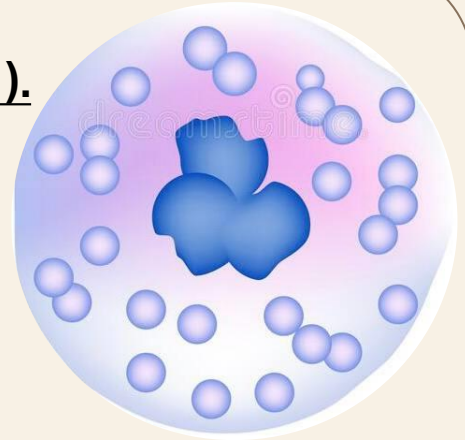
2- Eosinophils:

- . Accounts 1-4% of all leukocytes.
- . Their size similar to neutrophils.
- . Their nuclei stain red.
- . Their granules filled with a variety (of digestive enzymes).
- . Lifespan in blood: 8 to 12 days.



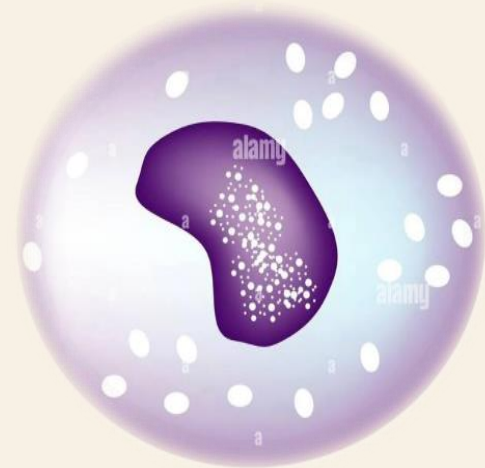
3- Basophils:

- . Accounts for 0.5% of all leukocytes (the rarest of all Leukocytes).
- . They contain large granules that stain purple to black.
- . Their granules contain histamine.
- . Lifespan in blood: a few hours to a few days.



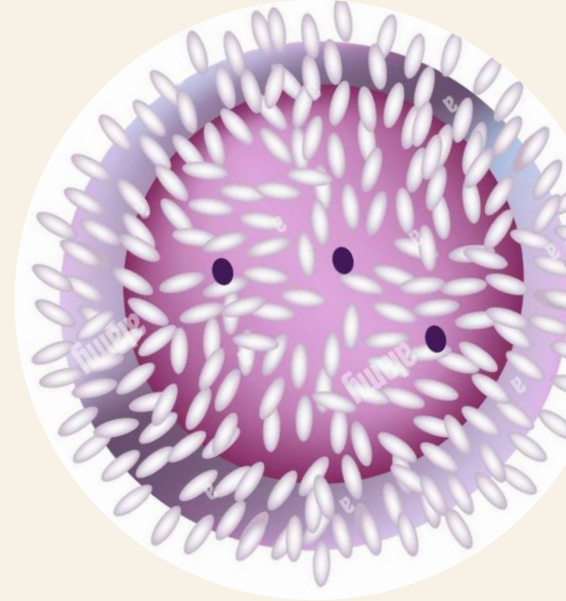
4- Monocytes:

- . Accounts for 4-8% of all leukocytes.
- . Their nucleus stain purple & has distinct shape like Kidney.
- . Monocytes can differentiate into macrophages.
- . Lifespan in blood: 3 days.



5- Lymphocytes:

- . Second most abundant type of leukocyte.
- . They have a large nucleus that stains deep purple to black.
- . the nucleus almost fills the entire cell.
- . Most lymphocytes, are found in lymphoid tissues.
- . Only few lymphocytes are found in bloodstream.
- . Lifespan in blood: memory cells may live for years.



common conditions and disorders that affect WBC?

- If you have a **low** white blood cell count, you are likely to get infections (**leukopenia**).
- Causes: Toxicity of some drugs, Malnutrition, Diseases of the bone marrow and blood cells, Autoimmune disorders
- If your white blood cell count is too **high (leukocytosis)** , you may have an infection or an underlying medical condition.
- Causes: including viral, bacterial, fungal, or parasitic infection, cancer, and exposure to certain medications or chemicals including steroids.

common symptoms of WBC disorders:

leukopenia

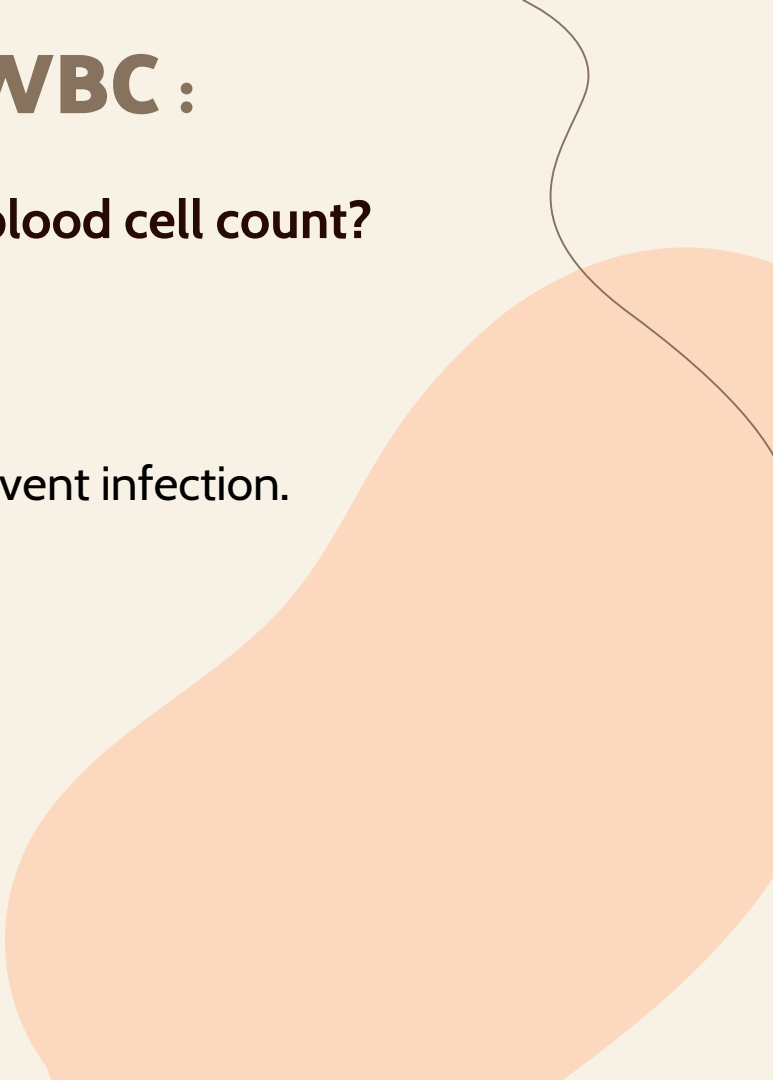
- . Sweating
- . Sore throat
- . Shortness of breath
- . area of your body that's become red, swollen, or painful
- . Mouth sores or white patches in your mouth

leukocytosis

- . Fever
- . Bleeding or bruising
- . Feeling weak, tired, or sick
- . Feeling dizzy, faint, or sweaty
- . Pain or tingling in your arms, legs, or abdomen
- . Losing weight without trying

How do I take care of my WBC :

What can I do to avoid/prevent a high white blood cell count?

- **Maintaining a healthy, active lifestyle.**
 - Practicing proper hygiene and handwashing to prevent infection.
 - Avoiding potential allergens.
 - Not smoking.
 - Reducing stress levels.
- 

How to maintain your immune system?

To minimize the chances of certain diseases and a low white blood cell count:

- Practice good hygiene. For instance, wash your hands after using the bathroom and before cooking.
- Be careful around pets and other animals that might transmit infections.
- Make sure foods are thoroughly cooked before eating them.
- Stay away from people who have infections.
- Practice safe sex; avoid drugs and sharing needles.

Conclusion:

- **Leukocytes are an important part of the Body's immune**
- **Leukocytes account for only about 1% of your blood. But are very important**
- Leukocytes are primary made in bone marrow.
- The 5 different types of white blood cells
(monocytes,lymphocytes,neutrophils,basophils and eosinophils) each has a specific function.
- Leukopenia: LOW leukocytes count ,May caused by cancer, vitamin deficiencies.
- Leukocytosis: HIGH leukocytes count ,most commonly caused by infection or inflammation.
- If necessary, a person can take medication to alter their leukocytes count.

Reference:

- 1. <https://my.clevelandclinic.org/health/body/21871-white-blood-cells>
- 2. <https://www.physio-pedia.com/Leukocytes>
- 3. <https://my.clevelandclinic.org/health/symptoms/17706-low-white-blood-cell-count>
- 4. <https://www.healthline.com/health/leukocytosis#prevention>



Thank you!