



Libyan International Medical University

Faculty of Pharmacy

LEUKOCYTES AND BONE MARROW

**PRESENTED BY 1ST YEAR PHARMD
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Objective

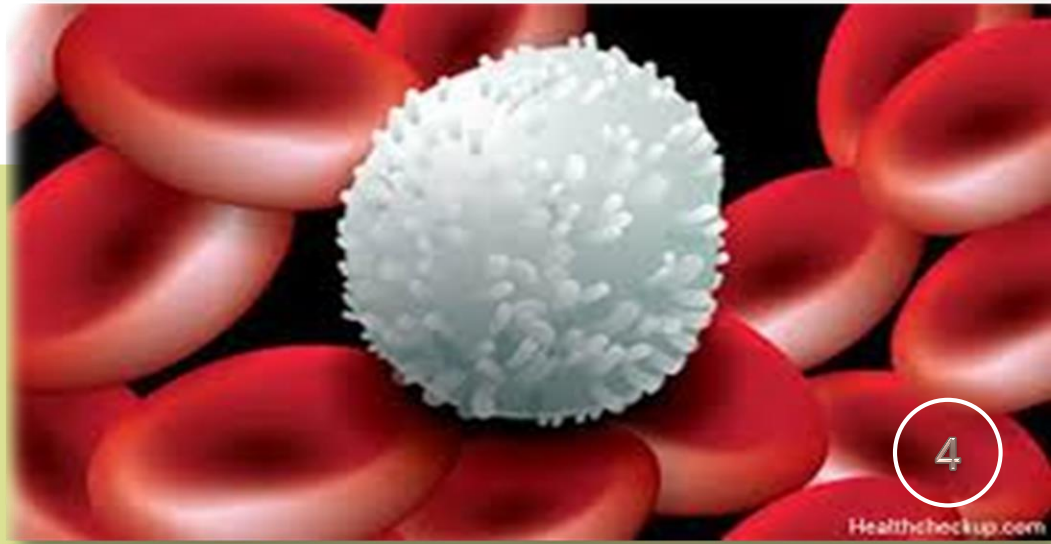
- **Definition of Leukocytes.**
- **Types of Leukocytes.**
- **Definition of bone marrow.**
- **Structure of bone marrow.**
- **Types of bone marrow.**
- **Diseases that related to bone marrow dysfunction.**

LEUKOCYTES



Leukocytes.

- White blood cells (WBC) are the cellular component of the blood that lacks hemoglobin, has a nucleus, is capable of motility, and defends the body against infection and disease.



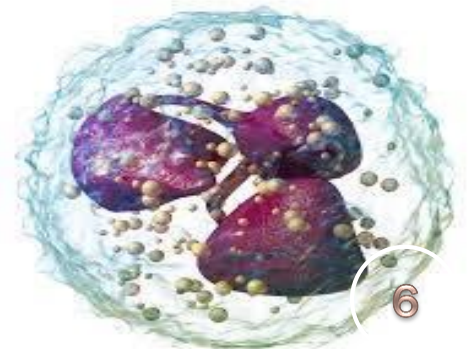
- Normal human level is 4000 to 11000 cell/mm³.
- Total WBC count can be done by manual or by automated cell counter .
- Abnormalities of leukocyte level may cause :
Leukocytosis or Leukopenia .



TYPES OF LEUKOCYTE OR (WHITE BLOOD CELL)

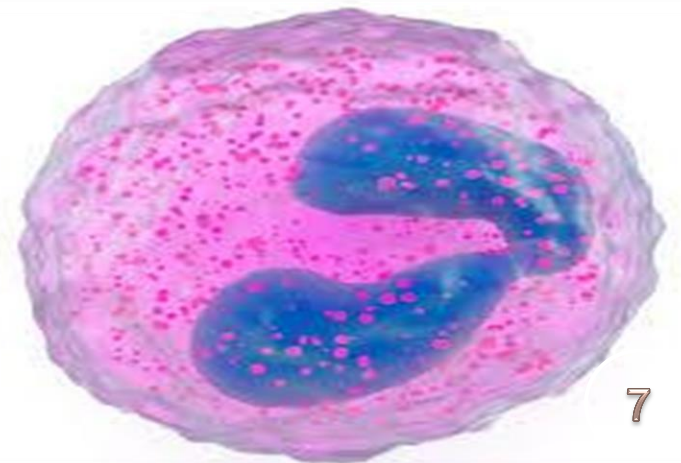
1-Neutrophils

- Most abundant type of WBC and the first responder to microbial infection.
- They are unable to renew their lysosomes and die after having phagocytosed a few pathogens .



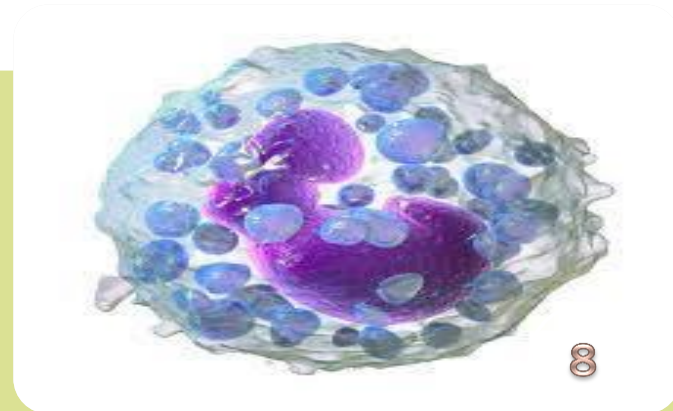
2-Eosinophils

- Prominent at the sites of allergic reactions and parasitic infections.
- they function as the primary response to large multicellular parasites (e.g. helminth infections).



3-Basophils

- Basophils are chiefly responsible for initiating inflammatory responses by releasing the chemicals histamine and heparin.
- Functionally they are similar to mast cells, however they circulate in the bloodstream whereas mast cells are localised.



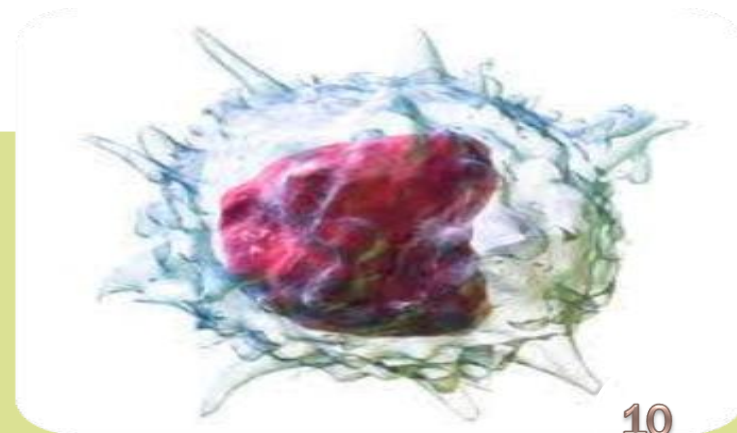
4-Monocytes

- Monocytes are the largest type of leukocyte and share phagocytosis duties with neutrophils.
- They are slower to respond than neutrophils but are longer lasting .

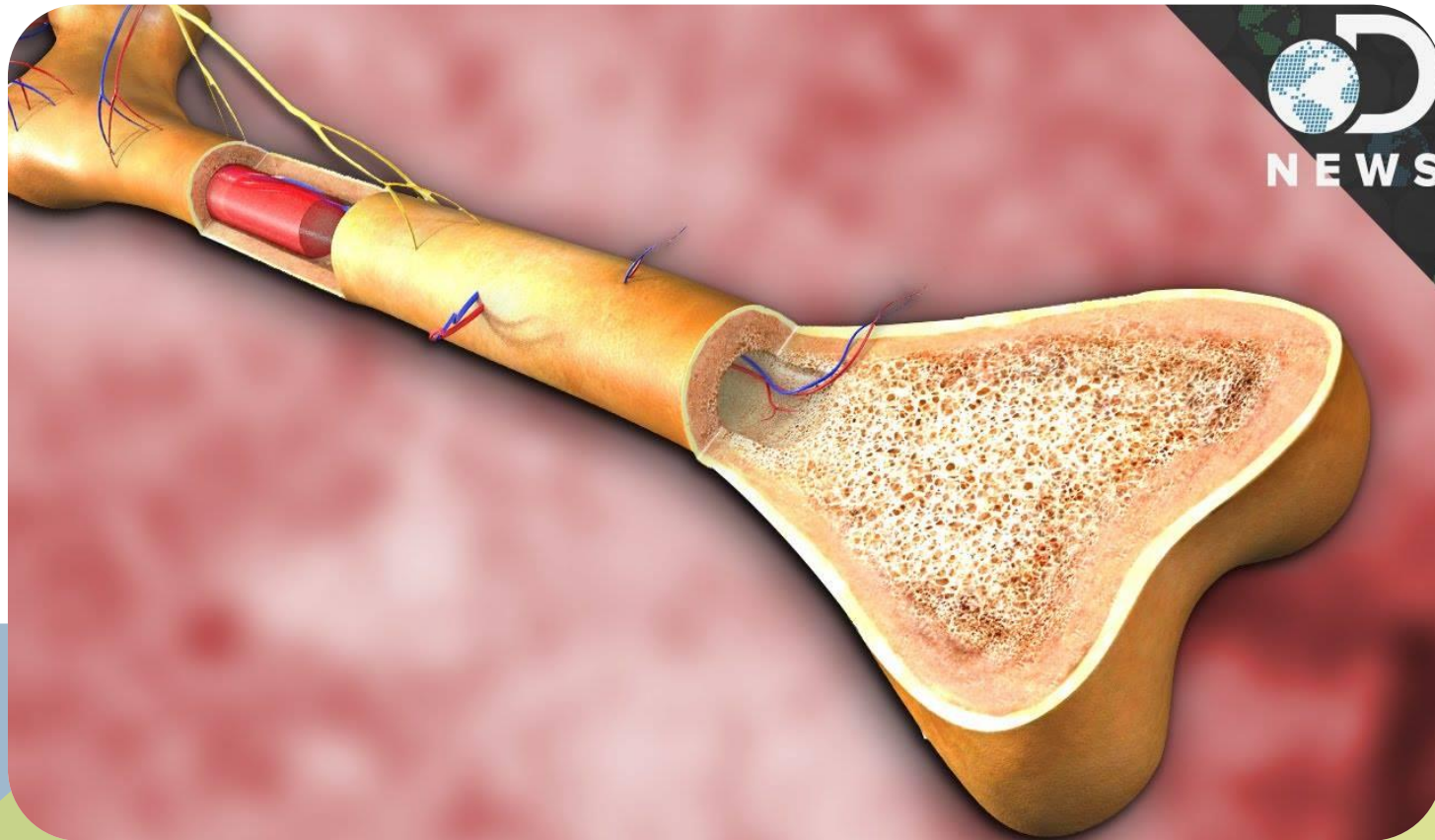


5-Lymphocytes

- Lymphocytes are responsible for the production of antibodies which target specific antigens present on pathogens.
- They are more common in the lymphatic system than blood and are slowest to respond. They have two types B and T lymphocytes .

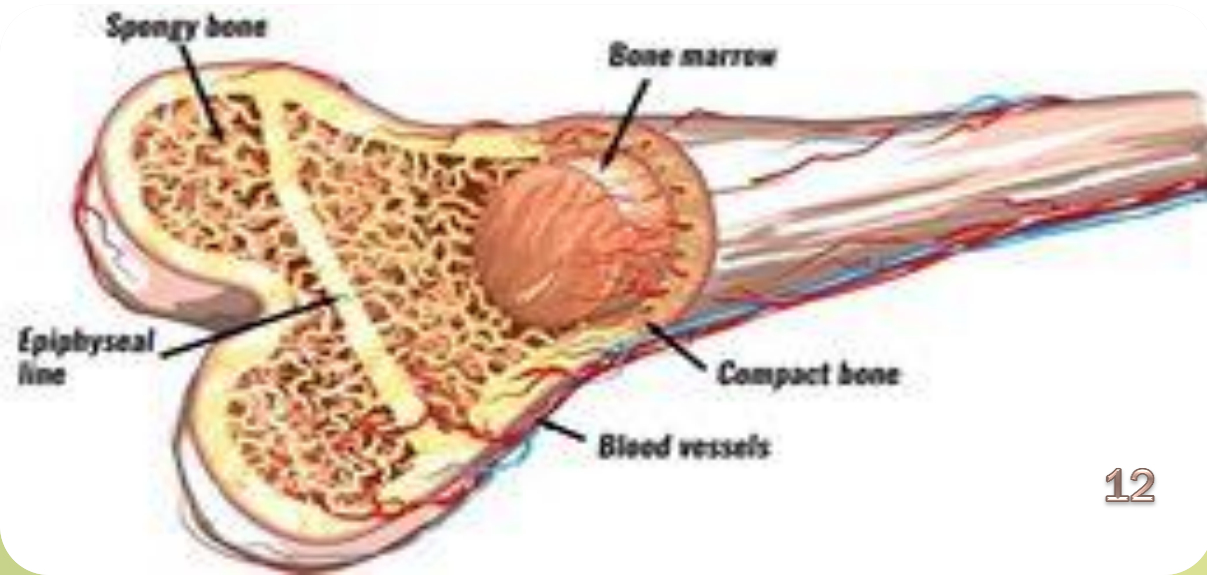


Bone marrow



BONE MARROW

- Bone marrow is the soft, flexible connective tissue within bone cavities. A component of the lymphatic system, bone marrow functions primarily to produce blood cells and to store fat. Bone marrow is highly vascular, meaning that it is richly supplied with a large number of blood vessels .

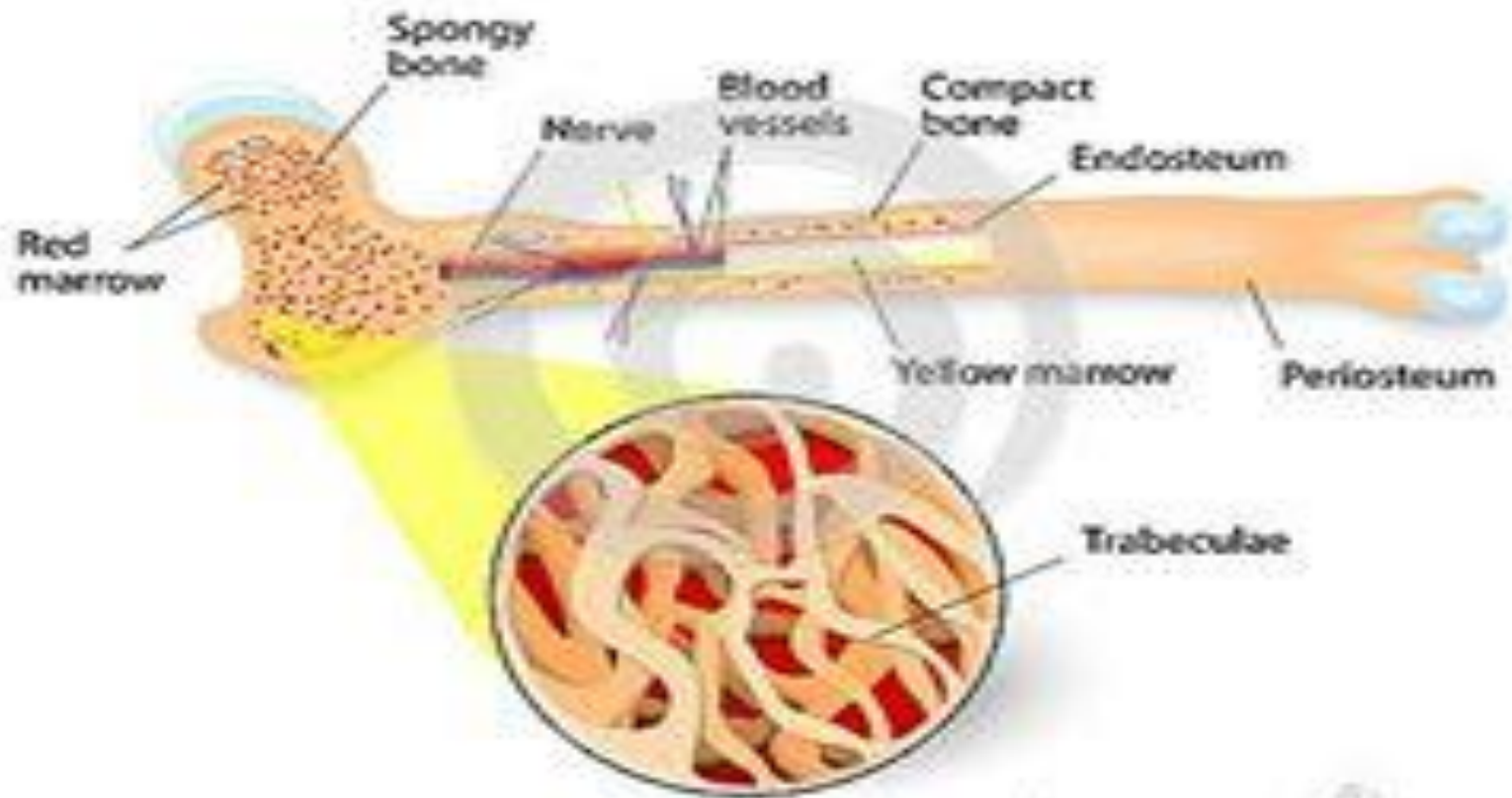


BONE MARROW STRUCTURE

- Bone marrow is separated into a vascular section and non-vascular sections. The vascular section contains blood vessels while The non-vascular sections of the bone marrow are where hematopoiesis or blood cell formation occurs.

STRUCTURE

BONE ANATOMY



TYPES BONE MARROW

- Consist bone marrow on two types occurs the lifetime.
- Red marrow
- yellow marrow

Types of bone marrow	Red marrow (hemopoietic)	Yellow marrow (stromal)
Occurs	inside the spongy bones.	inside the compact bones.
Function	Produce the red blood cell, white blood cells, platelets.	produce Fat cell, bone, and cartilage.
Cells	Cells actively divide to produce blood cells.	Cells store fats and produce blood cells when needed .
Colour originate	Get its red color due to the hemoglobin present in the red blood cells.	Gets its yellow color due to the carotenoids in the fat droplets.
Age	Occurs throughout the skeleton during the fetal life.	With age, this replaces the red bone marrow in long bones.
Blood supply	Rich in blood supply.	Has a poor blood supply

Diseases that related to Bone marrow

Bone marrow disease, there are problems with the stems cells such as:

- Leukemia.
- Aplastic anemia.

SUMMARY

- Leukocytes are main part of immune system, there are of five distinct types.
- All types of leukocytes are involved in phagocytosis except lymphocyte is immune response.
- Bone marrow is the soft spongy tissue that lies within the hollow interior of bones .

SUMMARY

- Bone marrow is divided to two types red and yellow marrow .
- Red marrow produces red blood cells and platelets.
- Yellow marrow produce bone , cartilage, and fat.
- Red bone marrow found in all bone types of children while yellow marrow present in adult .

REFERENCE

- <https://www.thoughtco.com/bone-marrow-anatomy-373236>
- <https://www.medicalnewstoday.com/articles/285666.php>
- <https://www.britannica.com/science/white-blood-cell>

