

**Leukocytosis:** It is a condition in which increase in number of white blood cells in the blood especially during an infection.

Causes: Infections, inflammation, allergic reaction, malignancy, hereditary disorders.

Diagnostic evaluation: history collection and physical examination

Blood investigations

Classification of leukocytosis:

- **Neutrophilia**
- **Lymphocytosis**
- **Monocytosis**
- **Eosinophilia**
- **Basophilia**

**Neutrophilia:** It is an increasing circulating neutrophil above that expected in a healthy individual of the same age, sex, race and physiological status.

**Causes:** pneumonia, cough, fevers, burns, wounds, accidents, fracture, appendicitis.

**Symptoms:** Low grade fever, mouth sores, swollen gums

**Treatment:** antipyretics for fever

Antibiotics for infection.

**Lymphocytosis:** High Lymphocytes count, is an increase in white blood cells

**Causes:** infection (bacterial, viral, other)

Cancer of the blood

Autoimmune disorders

**Symptoms:** weakness, weight loss, chills, fever, night sweats, swollen lymph nodes, pain in the belly.

**Treatment:** treating the underlying diseases

**Monocytosis:** increase in the monocyte count that exceeds than its normal rate.  $0.95 \times 10^9/L$ .

**Causes:** bacterial infections, tuberculosis, subacute bacterial endocarditis, brucellosis.

**Symptoms:** fatigue, dyspnea, petechiae, haemorrhage, skin lesions or splenomegaly

**Treatment:** treating underlying conditions

**Eosinophilia:** A high level of disease fighting white blood cells known as eosinophilia.

**Causes:** underlying diseases, allergies

**Symptoms:** rash, itching, diarrhoea, asthma, runny nose

**Basophilia:** It is the condition that having greater than 200 basophils / $\mu$ L.

**Causes:** allergic reactions, tuberculosis, influenza, inflammatory bowel disorder, smallpox, chronic haemolytic anemia.

**Treatment:** treat the underlying condition

**Leucopenia:** Reduction in number of white blood cells in the blood

## **Agranulocytosis**

The term agranulocytosis (Shultz syndrome) is used when neutropenia occurs as a reaction (most probably immunologic) to drugs.

**Neutropenia:** the presence of abnormally few neutrophils in the blood, leading to increased susceptibility to infection.

**Causes:** chemotherapy, bone marrow disorders

**Lymphopenia:** A condition in which there is lower than normal number of lymphocytes.

**Causes:** AIDS, undernutrition, infection, drugs, autoimmune disorders

**Basopenia:** It is a form of agranulocytosis associated with a deficiency of basophils.

**Monocytopenia:** It is a reduction in blood monocyte count.

**Eosinopenia:** Reduction of circulating eosinophilia.

# Lymphomas

These are malignant neoplasms originating in the bone marrow and lymphatic structures resulting in the proliferation of lymphocytes.

**Classifications:** Hodgkin's lymphoma

Non-Hodgkin's lymphoma

Hodgkin's lymphoma: It is a type of lymphoma in which cancer originates from a specific type of white blood cells called lymphocytes.

Non Hodgkin's lymphoma: It is a different group of blood cancer that include any kind of lymphomas except Hodgkin's lymphoma.

**Etiology:** infection with Epstein Barr virus, HIV

Genetic predisposition

Occupational toxins such as pesticides

**Clinical manifestations:**

Fever, cervical, axillary, inguinal lymph node enlargement, fever with night sweats, weight loss, fatigue, severe itching, weakness, chills, tachycardia, anemia, hepatosplenomegaly, cough, shortness of breath, red patches over the skin.

**Diagnostic evaluation:** history collection and physical examination

Blood and urine test

Lymph node biopsy

Lumbar puncture

Bone marrow examination

Peripheral blood smear

CT scan and MRI

PET

**Management:** chemotherapy

Radiation therapy

Stem cell transplantation

Surgical management: lymphadenectomy

# Myelomas

It is a cancer of plasma cells which is present in the blood.

**Causes and risk factors:** exact cause is unknown

**Risk factors:** genetic abnormalities

Exposure to chemicals

Leather workers

Book binders

Exposure to radiations

Viral infections

Autoimmune disorders

**Pathophysiology:**

The Normal immune system is get altered in the body



The abnormal plasma cells invade to the outer hard layer of the bone



The destruction of bone occurs



Fracture

**Clinical manifestations:**

Unexpected osteoporosis

Pain over the bone and joints especially in the bones of the chest and back

Hypercalcemia

Kidney damage

Fatigue

Nausea

Vomiting

Anorexia

Muscle weakness

Constipation

Decreased urine output

Dehydration

Increased thirst

Restlessness

Difficulty in attention and concentration

Visual problems

Shortness of breath

Decreased WBC count, platelet count

Bleeding, red patches over the body

**Diagnostic evaluation:**

history collection and physical examination

Blood and urine test

Lymph node biopsy

Lumbar puncture

Bone marrow examination

Peripheral blood smear

CT scan and MRI

PET, Xray

**Management:** It is rarely curable but is treatable.

- Chemotherapy
- Radiation therapy
- Stem cell transplantation

**Surgical management:** To strengthen the weakened bones.

