

## Unit 3 – TRANSPORTATION SYSTEMS

### Immune System - Lecture Notes

#### DESCRIBE THE BASIC FUNCTION AND STRUCTURES OF THE IMMUNE SYSTEM

##### Basic Functions:

- The basic function of the immune system is to provide immunity to the body by protecting against disease and identifying and killing pathogens and tumor cells.
- The immune system produces white blood cells and antibodies, and filters out organisms that cause disease.

##### Basic Structures:

- Tonsils
  1. Lymphoid tissue is located on either side of the throat.
  2. Tonsils act as part of the immune system to help protect against infection by destroying harmful organisms that enter the body through the mouth.
- Lymph Nodes
  1. Lymph nodes are filters or traps for foreign particles and contain white blood cells.
  2. They are found throughout the body in the neck, armpit, chest, abdomen, elbows, groin, and knees.
  3. Lymph nodes act as filters that collect and destroy bacteria and viruses. When the body is fighting an infection, lymphocytes multiply rapidly and produce a characteristic swelling of the lymph nodes.
- White Blood Cells
  1. Protect against infection and disease.
  2. Produced in the bone marrow and then move to other parts of the body until they are needed to fight infection.
  3. Not released into the bloodstream until they are needed.

#### DESCRIBE THE DISEASES AND DISORDERS OF THE IMMUNE SYSTEM

##### A. Human Immunodeficiency Virus (HIV) / Acquired Immune Deficiency Syndrome (AIDS)

Acquired Immune Deficiency Syndrome (AIDS) is a contagious disease that comprises the immune system. AIDS is caused by the human immunodeficiency virus (HIV). HIV is capable of becoming multi drug-resistant. HIV is a virus that affects T cells within the immune system. It attacks the RNA of the T cell, causing the T cell to alter its DNA structure to that of HIV. The result is that when infected T cells replicate, the T cell creates more HIV. AIDS is the final stage of HIV infection. The average incubation period for AIDS development is 10 years from the point of initial infection. AIDS is characterized by diseases called opportunistic infections, which are caused by microbes that do not cause illness in healthy people. There is no cure for AIDS. However, a variety of chemotherapeutic agents are lengthening the lives of HIV-infected individuals.

### B. Lupus

Lupus is a chronic, inflammatory, autoimmune disorder that may affect many organ systems including the skin, joints, and internal organs. In cases of lupus, the body's defenses are turned against itself and immune cells attack healthy tissues. Although the cause of autoimmune diseases is unknown, researchers suspect it occurs following infection with an organism that looks similar to particular proteins in the body. Lupus affects nine times as many women as men, and African Americans and Asians are affected most often. Symptoms may include fever, fatigue, weight loss, a butterfly rash covering the face, aggravation of the rash by sunlight, sensitivity to the sunlight, arthritis, swollen glands, muscle pain, nausea, vomiting, pleuritic chest pain, seizures, and psychosis. There is no cure for lupus. Treatments include medication and corticosteroids.

### C. Mononucleosis

Mononucleosis, also known as the kissing disease, is an infectious inflammatory disease caused by the Epstein-Barr virus (EBV). Mononucleosis most commonly affects young adults between the ages of 15 and 25. Outside the United States, the disease is asymptomatic for most children because they are exposed to EBV at an early age. The disease is generally self-limiting and few fatalities occur. When the disease is fatal, the cause of death is usually a ruptured spleen during vigorous activity. EBV is spread by transfer of saliva by contacts such as kissing, sharing drinking glasses, or drinking from public fountains. Symptoms include fever, sore throat, swollen lymph glands, enlarged spleen, muscle pain, and fatigue. There is no specific treatment available for mononucleosis.