UNIT 5
Cardiovascular and Lymphatic Systems
Pathological Conditions
Cardiovascular System
ANEURYSM

- Localized dilation of the wall of a blood vessel, usually an artery, due to a congenital defect or weakness in the vessel wall.
  - An aneurysm may rupture, causing hemorrhage, or thrombi may form in the dilation and give rise to emboli that may obstruct smaller vessels.
ANGINA PECTORIS

- Mild to severe pain or pressure in the chest caused by ischemia; also called angina.
  - Angina usually results from atherosclerosis of the coronary arteries. It can occur while resting or during exercise and is a warning sign of an impending myocardial infarction (MI).
ARRHYTHMIA

- Irregularity or loss of rhythm of the heartbeat; also called dysrhythmia.
  - Arrhythmias occur when the electrical impulses that stem from the conduction system of the heart do not function properly, causing the heart to deviate from the normal pattern heartbeat. Two common types of arrhythmia are flutter and fibrillation.
FIBRILLATION

- Irregular, random contraction of heart fibers.
  - Fibrillation commonly occurs in the atria or ventricles of the heart and is usually described by the part that is contracting abnormally, such as atrial fibrillation or ventricular fibrillation. Cardioversion is a medical procedure performed with a defibrillator. It is used to treat life-threatening arrhythmias, such as ventricular fibrillations, and restore the heart to normal sinus rhythm.
Thickening, hardening, and loss of elasticity of arterial walls; also called hardening of the arteries.

Arteriosclerosis results in altered function of tissues and organs.
ATHEROSCLEROSIS

- Most common form of arteriosclerosis, caused by accumulation of fatty substances within the arterial walls, resulting in partial and, eventually, total occlusion.
  - Atherosclerosis of the internal carotid artery results from a piece of plaque that may travel and block the lumina of blood vessels that supply blood to the brain.
BRUIT

- Soft blowing sound heard on auscultation caused by turbulent blood flow.
Abnormal condition that affects the heart’s arteries and produces various pathological effects, especially reduced flow of oxygen and nutrients to the myocardium.

- The most common form of CAD is coronary atherosclerosis. It is now the leading cause of death in the Western world.
DEEP VEIN THROMBOSIS (DVT)

- Formation of a blood clot in a deep vein of the body, occurring most commonly in the iliac and femoral veins.
EMBOLUS

- Mass of undissolved matter — commonly a blood clot, fatty plaque, or air bubble — that travels through the bloodstream and becomes lodged in a blood vessel.
  - Emboli may be solid, liquid, or gaseous. Occlusion of vessels from emboli usually results in the development of infarcts.
HEART BLOCK

- Interference with normal conduction of electrical impulses that control activity of the heart muscle.
  - Heart block is usually specified by the location of the block and the type.
Atrioventricular (AV) block in which the atrial electrical impulses are delayed by a fraction of a second before being conducted to the ventricles.

First-degree AV block is recognized on ECG by a prolonged PR interval. There is no specific treatment for first-degree AV block, but the condition is monitored because it may precede higher degrees of block.
SECOND-DEGREE

- AV block in which occasional electrical impulses from the SA node fail to be conducted to the ventricles.
  - Because of the dropped beats, the QRS complexes are dropped periodically, usually every second, third, or fourth beat.
THIRD-DEGREE

- AV block in which electrical impulses from atria fail to reach the ventricles; also called complete heart block (CHB).
  - In right- or left-bundle branch block, electrical impulses are unable to travel down the right or left bundle of His (or the bundle-branch Purkinje system). Treatment for second- or third-degree heart block consists of atropine (a drug used to increase heart rate) or pacemaker insertion.
HEART FAILURE

- Condition in which the heart cannot pump enough blood to meet the metabolic requirement of body tissues; formerly called congestive heart failure (CHF).
  - Heart failure may result from myocardial infarction, ischemic heart disease, and cardiomyopathy. It may also be caused by the dysfunction of organs other than the heart, especially the lungs, kidneys, and liver.
HYPERTENSION

- Consistently elevated blood pressure that is higher than 119/79 mm Hg, causing damage to the blood vessels and, ultimately, to the heart.
ISCHEMIA

- Inadequate supply of oxygenated blood to a body part due to an interruption of blood flow.
  - Some causes of ischemia are arterial embolism, atherosclerosis, thrombosis, and vasoconstriction.
MITRAL VALVE PROLAPSE (MVP)

- Condition in which the leaflets of the mitral valve prolapse into the left atrium during systole, resulting in incomplete closure and backflow of blood.
MURMUR

- Abnormal sound heard on auscultation, caused by defects in the valves or chambers of the heart.
MYOCARDIAL INFARCTION (MI)

- Necrosis of a portion of cardiac muscle caused by partial or complete occlusion of one or more coronary arteries; also called heart attack.
Failure of the ductus arteriosus to close after birth, resulting in an abnormal opening between the pulmonary artery and the aorta.
RAYNAUD PHENOMENON

- Numbness in fingers or toes due to intermittent constriction of arterioles in the skin.
- Raynaud phenomenon is typically caused by exposure to cold temperatures or emotional stress. It may also be an indicator of some other, more serious problem.
RHEUMATIC HEART DISEASE

- Streptococcal infection that causes damage to the heart valves and heart muscle, most commonly in children and young adults.
STROKE

- Damage to part of the brain due to interruption of its blood supply caused by bleeding with brain tissue or, more commonly, blockage of an artery, also called cerebrovascular accident (CVA).
  - When brain cells affected by stroke are deprived of oxygen, they cease to function. Movement, vision, and speech may be impaired.
THROMBUS

- Aggregation of platelets, fibrin, clotting factors, and the cellular elements of the blood attached to the interior wall of a vein or artery, sometimes occluding the lumen of the vessel; also called a blood clot.
TRANSIENT ISCHEMIC ATTACK (TIA)

- Temporary interference in the blood supply to the brain that causes no permanent brain damage.
VARICOSE VEINS

- Swollen superficial veins that are visible through the skin and usually occur in the legs.
  - Varicose veins commonly appear blue, bulging, and twisted. If left untreated, varicose veins can cause aching and feelings of fatigue as well as skin changes. Because the blood pools (collects), there is an increased risk of clot formation (thrombosis). Treatment consists of sclerosing chemicals (sclerotherapy), and surgical interventions such as endovenous laser ablation (ELT) of the greater saphenous veins with microphlebectomies of lesser saphenous veins.
CARDIAC CATHETERIZATION (CC)

- Insertion of a catheter into the heart through a vein or artery, usually of an arm (brachial approach) or leg (femoral approach) to provide evaluation of the heart.

- During CC, the cardiologist may also inject a contrast medium and take x-rays (angiography). Cardiac catheterization is used mainly in diagnosing and evaluating congenital, rheumatic, and coronary artery lesions, including myocardial infarction.
CARDIAC ENZYME STUDIES

- Battery of blood tests performed to determine the presence of cardiac damage.
ECHOCARDIOGRAPHY

- Use of ultrasound to evaluate the heart and great vessels and diagnose cardiovascular lesions.
ELECTROCARDIOGRAPHY (ECG)

- Creation and study of graphic records (electrocardiograms) produced by electric activity generated by the heart muscle; also called cardiography.
  - ECG is analyzed by a cardiologist and is valuable in diagnosing cases of abnormal heart rhythm and myocardial damage.
HOLTER MONITOR

- Monitoring device worn by a patient that records prolonged electrocardiograph readings (usually 24 hours) on a portable tape recorder while the patient conducts normal daily activities.
  - Holter monitoring provides a record of cardiac arrhythmia that would not be discovered by means of an ECG of only a few minutes’ duration. The patient keeps an activity diary to compare daily events with electrocardiograph tracings.
STRESS TEST

- ECG taken under controlled exercise stress conditions (typically using a treadmill) while measuring the amount of oxygen consumption.
  - A stress test may show abnormal ECG tracings that do not appear during an ECG taken when the patient is resting.
ECG that utilizes a radioisotope to evaluate coronary blood flow.

In a nuclear stress test, the radioisotope is injected at the height of exercise. The area not receiving sufficient oxygen is visualized by decreased uptake of the isotope.
TROPONIN I

- Blood test that measures protein released into the blood by damaged heart muscle (not skeletal muscle).
  - The troponin I test is a highly sensitive and specific indicator of recent myocardial infarction (MI).
ULTRASONOGRAPHY (US)

- Imaging technique that records high-frequency sound waves bouncing off body tissues and uses a computer to process those waves to produce an image of an internal organ or tissue.

  - Doppler ultrasonography measures blood flow in blood vessels. It allows the examiner to hear characteristic alteration in blood flow caused by vessel obstruction in various parts of an extremity.
ANGIOPLASTY

- Any endovascular procedure that reopens narrowed blood vessels and restores forward blood flow, usually using balloon dilation.
CORONARY ARTERY BYPASS GRAFT (CABG)

- Procedure in which a surgeon removes one or more of a patient’s peripheral veins and then sutures each end of the vein onto the coronary artery to route blood flow around a blockage in a coronary artery, thus increasing blood flow to the heart.
  - Generally, the saphenous vein from the leg or the right or left internal mammary artery from the chest wall are used in CABG.
CARDIOVERSION

- Delivery of brief discharges of electricity that pass across the chest to stop a cardiac arrhythmia and restore normal sinus rhythm; also called defibrillation.
  - A defibrillator is the electrical devise used for cardioversion.
DEFIBRILLATOR

- Device designed to administer a defibrillating electric shock to restore normal sinus rhythm.
  - There are two types of defibrillators: automatic implantable cardioverter-defibrillators (AICDs) and automatic external defibrillators (AEDs).
Surgically implanted defibrillator that automatically detects and corrects potentially fatal arrhythmias, such as ventricular fibrillations.

- An AICD is implanted, usually in the chest, in a patient who is at high risk for developing a serious arrhythmia. It has leads (wires) that go to the heart, sense its rhythm, and deliver an electrical shock if needed.
AUTOMATIC EXTERNAL DEFIBRILLATOR (AED)

- Portable computerized defibrillator that analyzes the patient’s heart rhythm and delivers an electrical shock to stimulate a heart in cardiac arrest.
  - An AED is kept on emergency response vehicles and in public places, such as recreation facilities, and is designed to be used by trained first-responder personnel or laypeople.
ENDARTERECTOMY

- Surgical removal of the lining of an artery.
  - Endarterectomy is performed on almost any major artery that is diseased or blocked, such as the carotid or femoral artery.
CAROTID ENDARTERECTOMY

- Surgical removal of plaque and thromboses from an occluded carotid artery.
  - Carotid endarterectomy can reduce the risk of stroke when it is performed on a patient with moderate or severe stenosis of the artery, with or without a history of transient ischemic attacks (TIAs).
SCLEROTHERAPY

- Chemical injection into a varicose vein that causes inflammation and formation of fibrous tissue, which closes the vein.
  - When a vein closes, it can no longer fill with blood. In a few weeks the treated varicose vein fades.
Valvuloplasty

- Plastic or restorative surgery on a valve, especially a cardiac valve.
  - A special type of valvuloplasty, called balloon valvuloplasty, involves insertion of a balloon catheter to open a stenotic heart valve. Inflation of the balloon decreases the constriction.
Lymphatic System
ACQUIRED IMMUNE DEFICIENCY SYNDROME (AIDS)

- Deficiency of cellular immunity induced by infection with the human immunodeficiency virus (HIV), characterized by increasing susceptibility to infections, malignancies, and neurological diseases.

  - HIV is transmitted from person to person in cell-rich body fluids (notably blood and semen) through sexual contact, sharing of contaminated needles (as by intravenous drug abusers), or other contact with contaminated blood (as in accidental needle sticks among health care workers).
HODGKIN DISEASE

- Malignant disease characterized by painless, progressive enlargement of lymphoid tissue (usually first evident in cervical lymph nodes), splenomegaly, and the presence of unique Reed-Sternberg cells in the lymph nodes.
KAPOSI SARCOMA

- Malignancy of connective tissue, including bone, fat, muscle, and fibrous tissue.
  - Kaposi sarcoma is closely associated with AIDS and is commonly fatal because the tumors readily metastasize to various organs.
LYMPHADENITIS

- Inflammation and enlargement of the lymph nodes, usually a result of infection.
MONONUCLEOSIS

- Acute infection caused by the Epstein-Barr virus (EBV) and characterized by a sore throat, fever, fatigue, and enlarged lymph nodes.
NON-HODGKIN LYMPHOMA

- Any of a heterogeneous group of malignant tumors involving lymphoid tissue except for Hodgkin disease; previously called lymphosarcoma.
BONE MARROW ASPIRATION BIOPSY

- Removal of living bone marrow tissue, usually taken from the sternum or iliac crest, for microscopic examination.
  - Bone marrow aspiration biopsy evaluates hematopoiesis by revealing the number, shape, and size of red blood cells (RBCs), white blood cells (WBCs), and platelet precursors.
ELISA

- Blood test used to screen for an antibody to the AIDS virus.
  - Positive outcome on this test indicates probable virus exposure and is confirmed with the **Western blot** test, which is more specific.
LYMPHANGIOGRAPHY

- Radiographic examination of lymph glands and lymphatic vessels after an injection of a contrast medium.
  - Lymphangiography is used to show the path of a lymph flow as it moves into the chest region.
Tissue Typing

- Technique used to determine the histocompatibility of tissues used in grafts and transplants with the recipient’s tissues and cells; also known as histocompatibility testing.
LYMPHANGIECTOMY

- Removal of a lymph vessel.
STATINS

- Drugs that reduce cholesterol levels by decreasing levels of low-density lipoproteins and triglycerides, and slightly increasing levels of high-density lipoproteins.
THROMBOLYTIC THERAPY

- Administration of drugs to dissolve a blood clot.