



Chapter 8 Cardiovascular System Diseases and Disorders

Anatomy and Physiology

- Cardiovascular system - heart, arteries, and veins with blood
- Heart is the size of a man's fist
- Heart is four chambered and muscular

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED. 3

Anatomy and Physiology

- Three layers of the heart
 - Epicardium
 - Myocardium
 - Endocardium

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED. 4

Diagnostic Tests

- Non-invasive procedures
 - Auscultation
 - Doppler
 - Electrocardiogram
 - Echocardiography
 - Ultrasound arteriography

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED. 5

Diagnostic Tests

- Cardiac Catheterization
 - Invasive procedure to determine oxygen content and blood pressure
- X-rays
 - To determine normal function of heart and vessels

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED. 6

Diagnostic Tests

- Common X-rays
 - Angiocardiology
 - Angiography
 - Venogram
- Blood Tests
- Enzymes including CPK, LDH

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

7

Common Diseases of the Cardiovascular System

- Diseases of arteries
 - Hypertension
 - Indicator of development of cerebrovascular, cardiovascular, and kidney disease
 - Chronic disease
 - Leading cause of stroke and heart failure

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

8

Common Diseases of the Cardiovascular System

- Diseases of arteries
 - Hypertension
 - Normal blood pressure is 120/80
 - Top number is systolic blood pressure measuring highest pressure in artery when ventricles contract

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

9

Common Diseases of the Cardiovascular System

- Diseases of arteries
 - Hypertension
 - Bottom number is diastolic blood pressure that measures pressure in artery when ventricles relax

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

10

Common Diseases of the Cardiovascular System

- Diseases of arteries
 - Hypertension
 - High blood pressure is greater than 140/90
 - Primary Hypertension - idiopathic with gradual onset
 - Primary hypertension is also called essential hypertension

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

11

Common Diseases of the Cardiovascular System

- Risk factors
 - Heredity
 - Diet
 - Age
 - Obesity
 - Smoking
 - Stress and type A personality

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

12

Common Diseases of the Cardiovascular System

- Hypertension Treatment
 - Anti-hypertensive medications
 - Lifestyle changes
 - Low salt diet
 - Stress-reducing exercise
 - Smoking cessation
 - Diuretics

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

13

Common Diseases of the Cardiovascular System

- Arteriosclerosis and atherosclerosis
 - Loss of elasticity and thickening of artery wall
 - “Hardening of arteries” is a lay term
 - Deposits of fatty or lipid material in wall of artery is called plaque

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

14

Common Diseases of the Cardiovascular System

- Arteriosclerosis and atherosclerosis
- Major areas affected by atherosclerosis
 - Coronary arteries
 - Cerebral arteries
 - Aorta
 - Peripheral arteries

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

15

Common Diseases of the Cardiovascular System

- Risk factors of atherosclerosis
 - Non-controllable factors
 - Heredity
 - Age
 - Sex
 - Diabetes

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

16

Common Diseases of the Cardiovascular System

- Risk factors of atherosclerosis
 - Controllable factors
 - Diet
 - Sedentary lifestyle
 - Stress
 - Cigarette smoking
 - Hypertension

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

17

Common Diseases of the Cardiovascular System

- Diagnosis of atherosclerosis - blood pressure, arteriograms, X-rays, doppler
- Treatment administered for symptoms
- Bypass surgery of occluded arteries and plaque removal

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

18

Common Diseases of the Cardiovascular System

- Peripheral Vascular Disease (PVD)
 - Caused by atherosclerotic plaque in arteries supplying blood to legs
 - Intermittent claudication - muscle cramps that are relieved with rest and increase with activity

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

19

Common Diseases of the Cardiovascular System

- Peripheral Vascular Disease (PVD)
 - Treatment includes an endarterectomy
 - If necrosis occurs, amputation or resection may be necessary

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

20

Common Diseases of the Cardiovascular System

- Aneurysm
 - Weakening in wall of artery creating a bulge or rupture
 - Usually asymptomatic and discovered accidentally

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

21

Common Diseases of the Cardiovascular System

- Aneurysm
 - Aorta is most common place
 - Treatment includes repairing aneurysm before rupture through resection and grafting

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

22

Common Diseases of the Cardiovascular System

- Coronary Artery Disease
 - Narrowing of arteries that supply blood to the myocardium
 - Single leading cause of death in United States
 - Commonly due to atherosclerosis

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

23

Common Diseases of the Cardiovascular System

- Coronary Artery Disease
 - Progressive narrowing of vessels may lead to ischemia of the heart muscle and symptoms
 - Scar tissue replaces muscle
 - Occlusion may progress slowly or suddenly as result of a thrombus or embolus

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

24

Common Diseases of the Cardiovascular System

- Coronary Artery Disease
 - Death of heart muscle is called a myocardial infarction
 - Diagnosis is based on history, EKG, angiograms
 - Treatment is aimed at increasing blood flow or decreasing oxygen needs

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

25

Common Diseases of the Cardiovascular System

- Coronary Artery Disease
 - Angina is treated with vasodilators
 - Angioplasty
 - Coronary artery bypass graft (CABG)
 - Reduce atherosclerotic risk factors - diet, exercise, and no smoking

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

26

Diseases of the Heart

- Angina Pectoris
 - Chest pain
 - Lack of oxygen to heart
 - Sign of impending myocardial infarction
 - Treatment: decrease workload of heart and nitroglycerin

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

27

Diseases of the Heart

- Myocardial Infarction
 - Heart attack
 - Occurs when heart does not get enough oxygen

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

28

Diseases of the Heart

- Myocardial Infarction
 - Classic symptoms
 - Severe chest pain with diaphoresis and nausea
 - Referred pain to neck, arm, and jaw with discomfort similar to bad or unrelieved indigestion

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

29

Diseases of the Heart

- Myocardial Infarction
 - Treatment
 - Immediate attention to prevent shock
 - Relieve respiratory distress
 - Decrease workload
 - If cardiac arrest, CPR must be performed

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

30

Diseases of the Heart

- Myocardial Infarction
 - Treatment
 - Oxygen and pain medication
 - Medications to treat arrhythmias
 - “Clot busting” medications
 - Education needed on prevention by lifestyle changes: smoking cessation, diet, exercise

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

31

Diseases of the Heart

- Hypertensive Heart Disease
 - Result of long-term hypertension
 - Causes are disease or disorder causing chronic elevation in blood pressure
 - Treatment: treating cause of hypertension
 - Can only be controlled, not cured

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

32

Diseases of the Heart

- Rheumatic Heart Disease
 - Autoimmune disorder
 - Caused by streptococcal throat infection
 - All layers of heart and valves can be affected

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

33

Diseases of the Heart

- Rheumatic Heart Disease
 - Treatment: prevention and treatment of streptococcal infections
 - Rest during acute stage
 - Valve replacement to correct deformity

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

34

Diseases of the Heart

- Congestive Heart Failure
 - Heart fails to pump adequate blood supply
 - Develops slowly and increases the workload of heart
 - Symptoms
 - Gradual increase in dyspnea

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

35

Diseases of the Heart

- Congestive Heart Failure
 - Symptoms
 - Tachycardia
 - Tachypnea
 - Neck vein distention

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

36

Diseases of the Heart

- Congestive Heart Failure
 - Symptoms
 - Edema in ankles and lower legs
 - Right sided leads to congestion of liver and spleen
 - Left sided leads to congestion of lungs

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

37

Diseases of the Heart

- Congestive Heart Failure
 - Diagnosis: history and physical, chest
 - X-ray, EKG
 - Treatment
 - Decrease workload
 - Diuretics

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

38

Diseases of the Heart

- Congestive Heart Failure
 - Treatment
 - Salt and fluid restrictions
 - Medications to strengthen and slow the heart such as digitalis

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

39

Diseases of the Heart

- Cardiomyopathy
 - Disease of heart muscle
 - Characterized by dilated, enlarged, thin, flabby heart muscle
 - Incurable leading to congestive heart failure, myocardial infarction and death

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

40

Diseases of the Heart

- Carditis
 - Inflammation of the heart such as pericarditis, myocarditis, endocarditis
 - Often secondary to respiratory, urinary tract, or skin infection
 - Treatment: rest, antibiotics, analgesics, and antipyretics

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

41

Diseases of the Heart

- Valvular Heart Disease
 - Malfunction of heart valves
 - Murmurs or abnormal heart sound
 - Causes
 - Congenital abnormalities or malformations
 - Rheumatic fever
 - Endocarditis

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

42

Diseases of the Heart

- Arrhythmias
 - Abnormal heart rhythm
 - Sinus rhythm is normal heart rhythm (60 to 120 beats per minute)
 - Fibrillation - wild and uncoordinated
 - Flutter - unusually fast heart rate (up to 350 beats per minute)

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

43

Diseases of the Heart

- Arrhythmias
 - Heart block: interruption in conduction system
 - Divided into first-, second-, or third-degree
 - Premature or early contractions (PVCs) may affect atria or ventricles
 - Treatment: unnecessary provided person is asymptomatic

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

44

Diseases of the Vein

- Phlebitis
 - Inflammation of superficial veins
 - Symptoms: pain, swelling, red-cord-like hardening along vein from injury toward heart

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

45

Diseases of the Vein

- Phlebitis
 - Treatment
 - Analgesics
 - Warm compresses
 - Elevation of area above heart level
 - Elastic stockings and exercise

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

46

Diseases of the Vein

- Deep Vein Thrombophlebitis
 - Clotting in vessels of legs, thighs, and pelvis
 - Asymptomatic until embolization occurs
 - Risk factors: immobility, dehydration, varicose veins

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

47

Diseases of the Vein

- Deep Vein Thrombophlebitis
 - Treatment
 - Reduce clot and prevent embolization
 - Anticoagulants

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

48

Diseases of the Veins

- Varicose Veins
 - Dilated, tortuous, and elongated veins in legs
 - Causes: prolonged sitting, standing, pregnancy, and obesity

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED. 49

Diseases of the Veins

- Varicose Veins
 - Symptoms: leg fatigue and cramps, thickening veins, edema, and fluid
 - Treatment: elevate legs, walking, and use of support or elastic hose
 - Vein stripping

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED. 50

Trauma

- Hemorrhage
 - Abnormal loss of blood
 - Acute or chronic
 - Exsanguination: loss of circulating blood
 - Internal bleeding can lead to anemia or shock due to blood loss

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED. 51

Trauma

- Hemorrhage
 - Low-pressure vessels lead to petechiae or ecchymosis or purpura
 - High-pressure vessels leads to squirting of bright red blood

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED. 52

Trauma

- Shock
 - Extremely low blood pressure that leads to decreased tissue perfusion

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED. 53

Trauma

- Shock
 - Types of shock
 - Cardiogenic
 - Septic
 - Hypovolemic
 - Neurogenic
 - Anaphylactic

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED. 54

Trauma

- Shock
 - Symptoms
 - Facial pallor
 - Cool and clammy skin
 - Cyanosis
 - Tachycardia
 - Tachypnea

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

55

Trauma

- Shock
 - Symptoms
 - Altered mental status
 - Syncope
 - Unconsciousness
 - Oliguria
 - Anuria

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

56

Trauma

- Shock
 - Treatment
 - Rest in supine position
 - Warm and quiet
 - Elevate feet and legs above heart

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

57

Rare Diseases

- Malignant Hypertension
- Cor Pulmonale
- Raynaud's Disease
- Buerger's Disease
- Polyarteritis Nodosa

Copyright © 2006 by Thomson Delmar Learning. ALL RIGHTS RESERVED.

58