

UNIT I Pathophysiologic Processes

1 Introduction to Pathophysiology

Framework for Pathophysiology
Concepts of Normality in Health and Disease
Epidemiology

2 Homeostasis Allostasis and Adaptive Responses to Stressors

Homeostasis and Allostasis
Stress as a Concept
Neurohormonal Mediators of Stress and Adaptation
Adaptation Coping and Illness

UNIT II Cellular Function

3 Cell Structure and Function

Plasma Membrane
Organization of Cellular Compartments
Cellular Metabolism
Functions of the Plasma Membrane
Intercellular Communication and Growth

4 Cell Injury Aging and Death

Reversible Cell Injury
Cellular Adaptation
Irreversible Cell Injury
Etiology of Cellular Injury
Aging
Somatic Death

5 Genome Structure Regulation and Tissue Differentiation

Structure and Function of Deoxyribonucleic Acid
Regulation of the Genome
Differentiation of Tissues

6 Genetic and Developmental Disorders

Principles of Inheritance
Genetic Disorders
Chromosomal Abnormalities
Mendelian Single-Gene Disorders
Nonmendelian Single-Gene Disorders
Polygenic and Multifactorial Disorders
Environmentally Induced Congenital Disorders
Diagnosis Counseling and Gene Therapy

7 Neoplasia

Benign Versus Malignant Growth
Epidemiology and Cancer Risk Factors
Genetic Mechanisms of Cancer
Multistep Nature of Carcinogenesis
Invasion and Metastasis
Effects of Cancer On the Body
Cancer Therapy

UNIT III Defense

8 Infectious Processes

Host-Microbe Relationship
Transmission of Infection
Types of Pathogenic Organisms

9 Inflammation and Immunity

Components of the Immune System
Epithelial Barriers
Mononuclear Phagocyte System
Lymphoid System
Leukocytes
Chemical Mediators of Immune Function
Innate Defenses and Inflammation
Inflammation
Healing
Inflammatory Exudates
Systemic Manifestations of Inflammation
Specific Adaptive Immunity
Major Histocompatibility Complex
Antigen Presentation By Major Histocompatibility Complex
Mechanisms of Cell-Mediated Immunity
Mechanisms of Humoral Immunity
Antibody Structure
Passive and Active Immunity
Integrated Function and Regulation of the Immune System
Integrated Response to Microbial Antigen
Integrated Response to Viral Antigen
Regulation of Immune Function

10 Alterations in Immune Function

Excessive Immune Responses
Autoimmunity
Hypersensitivity
Deficient Immune Responses

Primary Immunodeficiency Disorders
Secondary Immunodeficiency Disorders

11 Malignant Disorders of White Blood Cells

Classification of Hematologic Neoplasms
Etiology of Myeloid and Lymphoid Neoplasms
General Principles of Management
Myeloid Neoplasms
Lymphoid Neoplasms

12 HIV Disease and Aids

Epidemiology
Etiology
Pathogenesis
Diagnostic Testing
Monitoring the Progression of HIV
Clinical Manifestations
Treatment

UNIT IV Oxygen Transport Blood Coagulation Blood Flow and Blood Pressure

13 Alterations in Oxygen Transport

Composition of Blood
Structure and Function of Red Blood Cells
Gas Transport and Acid-Base Balance
Anemia
Anemia Related to Decreased Red Cell Production
Anemia Related to Inherited Disorders of the Red Cell
Anemia Related to Extrinsic Red Cell Destruction or Loss
Polycythemia

14 Alterations in Hemostasis and Blood Coagulation

The Process of Hemostasis
Evaluation of Hemostasis and Coagulation
Vascular and Platelet Disorders
Coagulation Disorders

15 Alterations in Blood Flow

Organization of the Circulatory and Lymphatic Systems
Principles of Flow
Control of Flow
General Mechanisms that Cause Altered Flow
Alterations in Arterial Flow
Alterations in Venous Flow
Alterations in Lymphatic Flow

16 Alterations in Blood Pressure

Arterial Blood Pressure
Mechanisms of Blood Pressure Regulation
Hypertension
Low Blood Pressure

UNIT V Cardiac Function

17 Cardiac Function

Cardiovascular Anatomy
Cardiac Cycle
Coronary Circulation
Cardiac Myocytes
Molecular Basis of Contraction
Cardiac Energy Metabolism
Cardiac Electrophysiology
Electrocardiography
Determinants of Cardiac Output
Endocrine Function of the Heart
Tests of Cardiac Function

18 Alterations in Cardiac Function

Coronary Heart Disease
Endocardial and Valvular Diseases
Myocardial Diseases
Pericardial Diseases
Congenital Heart Diseases

19 Heart Failure and Dysrhythmias

Heart Failure
Cardiac Dysrhythmias

20 Shock

Pathogenesis of Shock
Types of Shock
Assessment and Hemodynamic Monitoring
Complications of Shock

UNIT VI Respiratory Function

21 Respiratory Function and Alterations in Gas Exchange

Functional Anatomy
Ventilation
Pulmonary Blood Flow
Diffusion and Transport of Respiratory Gases

Alterations in Pulmonary Function
Diagnostic Tests
Alterations in Pulmonary Vasculature
Pulmonary Malignancies

22 Obstructive Pulmonary Disorders

Obstruction From Conditions in the Wall of the Lumen
Obstruction Related to Loss of Lung Parenchyma
Obstruction of the Airway Lumen

23 Restrictive Pulmonary Disorders

Lung Parenchyma Disorders
Atelectatic Disorders
Pleural Space Disorders
Neuromuscular Chest Wall and Obesity Disorders
Infection or Inflammation of the Lung

UNIT VII Fluid Electrolyte and Acid-Base Homeostasis

24 Fluid and Electrolyte Homeostasis and Imbalances

Body Fluid Homeostasis
Fluid Imbalances
Principles of Electrolyte Homeostasis
Electrolyte Imbalances

25 Acid-Base Homeostasis and Imbalances

Linda Felver
Acid-Base Homeostasis
Acid-Base Imbalances

UNIT VIII Renal and Bladder Function

26 Renal Function

Renal Anatomy
Overview of Nephron Structure and Function
Regulation of Glomerular Filtration
Transport Across Renal Tubules
Regulation of Blood Volume and Osmolality
Endocrine Functions
Age-Related Changes in Renal Function
Tests of Renal Structure and Function

27 Intrarenal Disorders

Common Manifestations of Kidney Disease
Congenital Abnormalities
Neoplasms

Infection
Obstruction
Glomerular Disorders (Glomerulopathies)

28 Acute Kidney Injury and Chronic Kidney Disease

Acute Kidney Injury
Chronic Kidney Disease
Clinical Management

29 Disorders of the Lower Urinary Tract

Lower Urinary Tract
Lower Urinary Tract Symptoms and Syndromes
Neurogenic Bladder
Congenital Disorders
Neoplasms
Inflammation and Infection
Obstruction

UNIT IX Genital and Reproductive Function

30 Male Genital and Reproductive Function

Courtney Foss
Anatomy
Embryology
Male Reproductive Physiology

31 Alterations in Male Genital and Reproductive Function

Disorders of the Penis and Male Urethra
Disorders of the Scrotum and Testes
Disorders of the Prostate

32 Female Genital and Reproductive Function

Reproductive Structures
Menstrual Cycle
Breast
Pregnancy
Menopause

33 Alterations in Female Genital and Reproductive Function

Menstrual Disorders
Alterations in Uterine Position and Pelvic Support
Inflammation and Infection of the Female Reproductive Tract
Benign Growths and Aberrant Tissue of the Female Reproductive Tract
Cancer of the Female Genital Structures
Disorders of Pregnancy

Disorders of the Breast

34 Sexually Transmitted Infections

Urethritis Cervicitis Salpingitis and Pelvic Inflammatory Disease

Diseases With Systemic Involvement

Diseases With Localized Lesions

Enteric Infections

UNIT X Gastrointestinal Function

35 Gastrointestinal Function

Structure and Organization of the Gastrointestinal Tract

Gastrointestinal Motility

Secretory Function

Digestion and Absorption

Gastrointestinal Function Across the Life Span

36 Gastrointestinal Disorders

Manifestations of Gastrointestinal Tract Disorders

Disorders of the Mouth and Esophagus

Oral Infections

Esophageal Disorders

Alterations in the Integrity of the Gastrointestinal Tract Wall

Inflammation of the Stomach and Intestines

Inflammatory Bowel Disease

Enterocolitis

Alterations in Motility and Malabsorption of the Gastrointestinal Tract

Motility Disorders

Mucosal Malabsorption Disorders

Malabsorption Disorders After Surgical Intervention

Neoplasms of the Gastrointestinal Tract

Esophageal Gastric and Small Intestinal Cancers

Colonic Polyps and Colon Cancer

Psychosocial Aspects of Gastrointestinal Disorders

37 Alterations in Function of the Gallbladder and Exocrine Pancreas

Anatomy and Physiology of the Pancreaticobiliary System

Disorders of the Gallbladder

Disorders of the Pancreas

38 Liver Diseases

Structure and Function of the Liver

General Manifestations of Liver Disease

Disorders of the Liver

Cirrhosis

Toxic Liver Disorders
Other Structural Liver Conditions
Transplantation
Liver Diseases and Pediatric Considerations
Liver Diseases and Geriatric Considerations

UNIT XI Endocrine Function Metabolism and Nutrition

39 Endocrine Physiology and Mechanisms of Hypothalamic Pituitary Regulation

Hormone Structure and Action
Hormone Regulation
Hypothalamic-Pituitary Endocrine System
Thyroid Hormones
Steroid Hormones
Categories of Endocrine Disease

40 Disorders of Endocrine Function

Basic Concepts of Endocrine Disorders
Growth Hormone Disorders
Thyroid Hormone Disorders
Adrenocortical Hormone Disorders
Adrenal Medulla Disorder
Parathyroid Gland Disorders
Antidiuretic Hormone Disorders

41 Diabetes Mellitus

Regulation of Glucose Metabolism
Glucose Intolerance Disorders
Clinical Manifestations and Complications
Treatment and Education
Pediatric Considerations
Geriatric Considerations

42 Alterations in Metabolism and Nutrition

Metabolic Processes
Nutrient Metabolism
Regulation of Appetite and Nutrient Metabolism
Obesity and Metabolic Syndrome
Metabolic Responses to Starvation and Physiologic Stress
Nutritional Considerations for Aging and Altered Health States

UNIT XII Neural Function

43 Structure and Function of the Nervous System

Structural Organization
Central Nervous System

Peripheral Nervous System
Autonomic Nervous System
Neuronal Structure and Function
Neurons and Supportive Cells
Neuronal Communication
Neural Development Aging and Injury
Sensory Function
Sensory Receptors
Sensory Pathways
Somatosensory Cortex
Motor Function
Motor Neurons
Spinal Reflexes
Central Control of Motor Function
Consciousness Memory and Sleep
Consciousness and Memory
Sleep

44 Acute Disorders of Brain Function

Mechanisms of Brain Injury
Manifestations of Brain Injury
Traumatic Brain Injury
Epidemiology
Types of Traumatic Brain Injury
Primary Injury
Secondary Injury
Treatment
Cerebrovascular Disease and Stroke
Epidemiology
Ischemic Stroke
Hemorrhagic Stroke
Treatment
Stroke Sequelae
Cerebral Aneurysm and Arteriovenous Malformation
Cerebral Aneurysms
Arteriovenous Malformation
Central Nervous System Infections
Meningitis
Encephalitis
Brain Abscess

45 Chronic Disorders of Neurologic Function

Brain and Cerebellar Disorders
Spinal Cord and Peripheral Nerve Disorders

46 Alterations in Special Sensory Function

Hearing and Balance
Structure and Function of the Ear
General Manifestations of Hearing Impairment
Hearing Impairment Disorders
Otitis Media
Interventions for Individuals With Hearing Impairment
Vision
Structure of the Eye
Visual Pathways
General Manifestations of Visual Impairment
Disorders of the Eye
Interventions for Individuals With Vision Impairment
Smell and Taste
Disorders of Smell and Taste

47 Pain

Physiology of Pain
Types of Pain
Acute Pain
Chronic Pain
Cancer-Related Pain
Neuropathic Pain
Ischemic Pain
Referred Pain
Physiologic Responses to Pain
Pain in the Young and the Elderly
Treatment Modalities
Pharmacologic and Nonpharmacologic Pain Management

UNIT XIII Neuropsychological Function

48 Mental Health Disorders

Neurobiology of Psychiatric Disorders
Common Psychiatric Disorders

UNIT XIV Musculoskeletal Support and Movement

49 Structure and Function of the Musculoskeletal System

Structure and Function of Bone
Structure and Function of Joints
Structure and Function of Articular Cartilage
Structure and Function of Tendons and Ligaments
Structure and Function of Skeletal Muscle
Mechanics of Muscle Contraction

50 Alterations in Musculoskeletal Function Trauma Infection and Disease

Soft Tissue Injuries

Inert Soft Tissue Injuries

Contractile Soft Tissue Injuries

Bone Injuries and Infections

Bone and Joint Trauma

Infections of the Bone

Alterations in Bone Structure and Mass

Bone Structure Disorders

Metabolic Bone Diseases

Bone Tumors

Diseases of Skeletal Muscle

Idiopathic Inflammatory Myopathy

Muscular Dystrophy

Other Disorders of Muscle

Myasthenia Gravis

Chronic Muscle Pain

51 Alterations in Musculoskeletal Function Rheumatic Disorders

Local Disorders of Joint Function

Systemic Disorders of Joint Function

Joint Dysfunction Secondary to Other Diseases

Pediatric Joint Disorders

UNIT XV Integumentary System

52 Alterations in the Integumentary System

Age-Related Changes

Evaluation of the Integumentary System

Selected Skin Disorders

Infectious Processes

Inflammatory Conditions

Allergic Skin Responses

Parasitic Infestations

Other Disorders of the Dermis

Special Characteristics of Dark Skin

Integumentary Manifestations of Systemic Disease

Treatment Implications

Developmental Considerations

53 Burn Injuries

Thermal Injury

Electrical Injury

Chemical Injury

Special Populations

Index