STEP 1 Content Outline

1. General Principles

1.1 Biochemistry and molecular biology

- 1.1.1 gene expression: DNA structure, replication, and exchange
  - 1.1.1.1 DNA structure: single- and double-stranded DNA, stabilizing forces, supercoiling
  - 1.1.1.2 analysis of DNA: sequencing, restriction analysis, PCR amplification, hybridization
  - 1.1.1.3 DNA replication, mutation, repair, degradation, and inactivation
  - 1.1.1.4 gene structure and organization; chromosomes; centromere, telomere
  - 1.1.1.5 recombination, insertion sequences, transposons
  - 1.1.1.6 mechanisms of genetic exchange, including transformation, transduction, conjugation, crossover, recombination, linkage
  - 1.1.1.7 plasmids and bacteriophages
- 1.1.2 gene expression: transcription, including defects
  - 1.1.2.1 transcription of DNA into RNA, enzymatic reactions, RNA, RNA degradation
  - 1.1.2.2 regulation: cis-regulatory elements, transcription factors, enhancers, promoters, silencers, repressants, splicing
- 1.1.3 gene expression: translation, including defects
  - 1.1.3.1 the genetic code
  - 1.1.3.2 structure and function of tRNA
  - 1.1.3.3 structure and function of ribosomes
  - 1.1.3.4 protein synthesis
  - 1.1.3.5 regulation of translation
  - 1.1.3.6 post-translational modifications, including phosphorylation, addition of CHO units
  - 1.1.3.7 protein degradation
- 1.1.4 structure and function of proteins
  - 1.1.4.1 principles of protein structure and folding
  - 1.1.4.2 enzymes: kinetics, reaction mechanisms
  - 1.1.4.3 structural and regulatory proteins: ligand binding, self-assembly
  - 1.1.4.4 regulatory properties
- 1.1.5 energy metabolism, including metabolic sequences and regulation
  - 1.1.5.1 generation of energy from carbohydrates, fatty acids, and essential amino acids; glycolysis, pentose phosphate pathway, tricarboxylic acid cycle, ketogenesis, electron transport and oxidative phosphorylation, glycogenolysis
  - 1.1.5.2 storage of energy: gluconeogenesis, glycogenesis, fatty acid and triglyceride synthesis
  - 1.1.5.3 thermodynamics: free energy, chemical equilibria and group transfer potential, energetics of ATP and other high-energy compounds
- 1.1.6 metabolic pathways of small molecules and associated diseases
  - 1.1.6.1 biosynthesis and degradation of amino acids (eg, homocystinuria; maple syrup urine disease)
  - 1.1.6.2 biosynthesis and degradation of purine and pyrimidine nucleotides

1.1.6.3 biosynthesis and degradation of lipids (eg, dyslipidemias, carnitine deficiency)
1.1.6.4 biosynthesis and degradation of porphyrins
1.1.6.5 galactosemia and other small sugar disorders
1.1.6.6 biosynthesis and degradation of alcohols and other small molecules

1.1.7 biosynthesis and degradation of other macromolecules and associated abnormalities, complex carbohydrates (eg, lysosomal storage disease), glycoproteins, and proteoglycans (eg, type II glycogen storage disease)

1.2 Biology of cells

1.2.1 structure and function of cell components
1.2.1.1 endoplasmic reticulum
1.2.1.2 Golgi complex
1.2.1.3 mitochondria
1.2.1.4 lysosome, peroxisome, endosome
1.2.1.5 centriole, microtubule
1.2.1.6 ribosome, polysome
1.2.1.7 plasma membrane (eg, glycolipids, glycoproteins, glycosaminoglycans, membrane fluidity)
1.2.1.8 cytosol
1.2.1.9 cilia
1.2.1.10 nucleus, including chromatin, nucleolus, the nuclear envelope, and nuclear matrix
1.2.1.11 cytoskeleton (eg, actin filaments, intermediate filaments, microtubules)

1.2.2 signal transduction
1.2.2.1 basic principles: autocrine, paracrine, endocrine
1.2.2.2 receptors and channels
1.2.2.2.1 protein kinase receptors
1.2.2.2.2 non-protein kinase receptors
1.2.2.2.3 nuclear receptors
1.2.2.2.4 G protein-linked receptors
1.2.2.2.5 voltage-gated channels
1.2.2.2.6 ligand-gated channels
1.2.2.3 second messengers (eg, IP_3, DAG, PKA, PKC)
1.2.2.4 signal transduction pathways (eg, MAPK, JNK, TGF-β)

1.2.3 cell-cell and cell-matrix adhesion
1.2.4 cell motility
1.2.5 intracellular sorting (eg, trafficking, endocytosis)
1.2.6 cellular homeostasis (eg, turnover, pH maintenance, proteasome, ions, soluble proteins)
1.2.7 cell cycle
1.2.7.1 mitosis
1.2.7.2 meiosis
1.2.7.3 structure of spindle apparatus
1.2.7.4 cell cycle regulation (eg, cyclins, cdks, cdk inhibitors)

1.2.8 structure and function of basic tissue components
1.2.8.1 epithelial cells
1.2.8.2 connective tissue cells (eg, fibroblasts)
1.2.8.3 muscle cells
1.2.8.4 nerve cells

1.2.8.5 extracellular matrix (eg, basement membranes)
1.2.9 adaptive cell response to injury
1.2.10 intracellular accumulations (eg, pigments, fats, proteins, carbohydrates, minerals, inclusions, vacuoles)
1.2.11 mechanisms of injury and necrosis
1.2.12 apoptosis

1.3 Human development and genetics

1.3.1 embryogenesis: programmed gene expression, tissue differentiation and morphogenesis, homeotic genes; developmental regulation of gene expression
1.3.2 congenital abnormalities: principles, patterns of anomalies, dysmorphogenesis
1.3.3 principles of pedigree analysis
1.3.3.1 inheritance patterns
1.3.3.2 occurrence and recurrence risk determination
1.3.4 population genetics: Hardy-Weinberg law, founder effects, mutation-selection equilibrium
1.3.5 genetic mechanisms
1.3.5.1 chromosomal abnormalities: translocations; deletions; duplications, including nucleotide repeats and inversions, mosaicism
1.3.5.2 mendelian inheritance
1.3.5.2.1 homozygosity, heterozygosity
1.3.5.2.2 phenotypic variation: pleiotropy, variable expression, delayed onset
1.3.5.2.3 imprinting
1.3.5.2.4 polymorphisms
1.3.5.3 multifactorial diseases
1.3.6 clinical genetics
1.3.6.1 genetic testing
1.3.6.2 prenatal diagnosis
1.3.6.3 newborn screening
1.3.6.4 genetic counseling: ethics
1.3.6.5 gene therapy

1.4 Biology of tissue response to disease

1.4.1 inflammation, including cells and mediators
1.4.1.1 acute inflammation and mediator systems
1.4.1.2 vascular response to injury, including mediators
1.4.1.3 inflammatory cell recruitment, including adherence and cell migration, and phagocytosis
1.4.1.4 bactericidal mechanisms and tissue injury
1.4.1.5 clinical manifestations (eg, pain, fever, leukocytosis, leukemoid reaction, chills)
1.4.1.6 chronic inflammation
1.4.2 reparative processes
1.4.2.1 wound healing, hemostasis, and repair: thrombosis, granulation tissue, angiogenesis, fibrosis, scar/keloid formation
1.4.2.2 regenerative processes
1.4.3 neoplasia
1.4.3.1 classification of neoplasms; histologic diagnosis of malignancy
1.4.3.2 grading and staging of neoplasms

1.4.3.3 cell biology, biochemistry, and molecular biology of neoplastic cells: transformation, oncogenes, altered cell differentiation and proliferation
1.4.3.4 hereditary neoplastic disorders
1.4.3.5 invasion and metastasis
1.4.3.6 tumor immunology
1.4.3.7 paraneoplastic manifestations of cancer
1.4.3.8 cancer epidemiology and prevention

1.5 Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental

1.5.1 progression through the life cycle, including birth through senescence
1.5.1.1 cognitive, language, motor skills, and social and interpersonal development
1.5.1.2 sexual development (eg, puberty, menopause)
1.5.1.3 influence of developmental stage on physician-patient interview
1.5.2 psychologic and social factors influencing patient behavior
1.5.2.1 personality traits or coping style, including coping mechanisms
1.5.2.2 psychodynamic and behavioral factors, related past experience
1.5.2.3 family and cultural factors, including socioeconomic status, ethnicity, and gender
1.5.2.4 adaptive behavioral responses to stress and illness
1.5.2.5 maladaptive behavioral responses to stress and illness (eg, drug-seeking behavior, sleep deprivation)
1.5.2.6 interactions between the patient and the physician or the health care system (eg, transference)
1.5.2.7 patient adherence
1.5.2.7.1 general
1.5.2.7.2 adolescent
1.5.3 patient interviewing, consultation, and interactions with the family
1.5.3.1 establishing and maintaining rapport
1.5.3.2 data gathering
1.5.3.3 approaches to patient education
1.5.3.4 enticing patients to make lifestyle changes
1.5.3.5 communicating bad news
1.5.3.6 “difficult” interviews (eg, anxious or angry patients)
1.5.3.7 multicultural ethnic characteristics
1.5.4 medical ethics, jurisprudence, and professional behavior
1.5.4.1 consent and informed consent to treatment
1.5.4.2 physician-patient relationships (eg, ethical conduct, confidentiality)
1.5.4.3 death and dying
1.5.4.4 birth-related issues
1.5.4.5 issues related to patient participation in research
1.5.4.6 interactions with other health professionals (eg, referral)
1.5.4.7 sexuality and the profession; other “boundary” issues
1.5.4.8 ethics of managed care
1.5.4.9 organization and cost of health care delivery

1.6 Multisystem processes

1.6.1 nutrition

1.6.1.1 generation, expenditure, and storage of energy at the whole-body level
1.6.1.2 assessment of nutritional status across the life span, including calories, protein, essential nutrients, hypoalimentation
1.6.1.3 functions of nutrients, including essential, trans-fatty acids, cholesterol
1.6.1.4 protein-calorie malnutrition
1.6.1.5 vitamin deficiencies and/or toxicities
1.6.1.5.1 vitamin A
1.6.1.5.2 vitamin B complex
1.6.1.5.3 vitamin C
1.6.1.5.4 vitamin D
1.6.1.5.5 vitamin E
1.6.1.5.6 vitamin K
1.6.1.6 mineral deficiencies and toxicities
1.6.1.7 eating disorders
1.6.1.7.1 obesity
1.6.1.7.2 anorexia and bulimia
1.6.1.7.3 alternative diets, nutritional supplements, and food fads
1.6.1.7.4 treatment of eating disorders
1.6.2 temperature regulation
1.6.3 adaptation to environmental extremes, including occupational exposures
1.6.3.1 physical and associated disorders
1.6.3.1.1 temperature
1.6.3.1.2 radiation
1.6.3.1.3 burns, including electrocution, lightning
1.6.3.1.4 decreased atmospheric pressure, high-altitude sickness
1.6.3.1.5 increased water pressure (eg, "bends")
1.6.3.2 chemical
1.6.3.2.1 gases, vapors, smoke inhalation (eg, poison gases)
1.6.3.2.2 agricultural hazards (eg, insecticides)
1.6.3.2.3 volatile organic solvents (eg, chloroform)
1.6.3.2.4 heavy metals (eg, lead)
1.6.3.2.5 principles of poisoning and therapy
1.6.4 fluid, electrolyte, and acid-base balance and disorders (eg, dehydration, acidosis, alkalosis)

1.7 Pharmacodynamic and pharmacokinetic processes
1.7.1 general principles
1.7.1.1 pharmacokinetics: absorption, distribution, metabolism, excretion, dosage intervals
1.7.1.2 mechanisms of drug action, structure-activity relationships
1.7.1.3 concentration- and dose-effect relationships (eg, efficacy, potency), types of agonists (eg, full, partial, inverse) and antagonists and their actions
1.7.1.4 individual factors altering pharmacokinetics and pharmacodynamics (eg, age, gender, disease, tolerance, compliance, body weight, metabolic proficiency, pharmacogenetics)
1.7.1.5 drug side effects, overdosage, toxicology
1.7.1.6 drug interactions

1.7.1.7 regulatory issues (eg, drug development, approval, scheduling)

1.7.2 general properties of autacoids
- 1.7.2.1 peptides and analogs
- 1.7.2.2 biogenic amines
- 1.7.2.3 prostanoids and their inhibitors
- 1.7.2.4 smooth muscle/endothelial autacoids (eg, nitric oxide)

1.7.3 general principles of autonomic pharmacology

1.7.4 general properties of antimicrobials, including mechanisms of action and resistance
- 1.7.4.1 antibacterials
  - 1.7.4A aminoglycosides
  - 1.7.4B cephalosporins and penicillins
  - 1.7.4C quinolones and tetracyclines
  - 1.7.4D antituberculous
  - 1.7.4E other antibacterials
- 1.7.4.2 antivirals
  - 1.7.4F antiretrovirals
  - 1.7.4G other antivirals
- 1.7.4.3 antifungals
  - 1.7.4H antifungals
- 1.7.4.4 antiparasitics
  - 1.7.4E antiparasitics

1.7.5 general properties of antineoplastic agents and immunosuppressants, including drug effects on rapidly dividing mammalian cells

1.8 Microbial biology and infection

1.8.1 microbial classification and its basis

1.8.2 bacteria and bacterial diseases
- 1.8.2.1 structure and composition
- 1.8.2.2 metabolism, physiology, and regulation
- 1.8.2.3 genetics
- 1.8.2.4 nature and mechanisms of action of virulence factors
- 1.8.2.5 pathophysiology of infection
- 1.8.2.6 epidemiology and ecology
- 1.8.2.7 principles of cultivation, assay, and laboratory diagnosis

1.8.3 viruses and viral diseases
- 1.8.3.1 physical and chemical properties
- 1.8.3.2 replication
- 1.8.3.3 genetics
- 1.8.3.4 principles of cultivation, assay, and laboratory diagnosis
- 1.8.3.5 molecular basis of pathogenesis
- 1.8.3.6 pathophysiology of infection
- 1.8.3.7 latent and persistent infections
- 1.8.3.8 epidemiology
- 1.8.3.9 oncogenic viruses

1.8.4 fungi and fungal infections
- 1.8.4.1 structure, physiology, cultivation, and laboratory diagnosis
- 1.8.4.2 pathogenesis and epidemiology

1.8.5 parasites and parasitic diseases

1.8.5.1 structure, physiology, and laboratory diagnosis
1.8.5.2 pathogenesis and epidemiology
1.8.6 principles of sterilization and pure culture technique

1.9 Immune responses

1.9.1 production and function of granulocytes, natural killer cells, and macrophages
1.9.2 production and function of T lymphocytes, T-lymphocyte receptors
1.9.3 production and function of B lymphocytes and plasma cells; immunoglobulin and antibodies: structure and biologic properties
1.9.4 antigenicity and immunogenicity; antigen presentation; cell activation and regulation; tolerance and clonal deletion
1.9.5 immunologic mediators: chemistry, function, molecular biology, classic and alternative complement pathways, cytokines, chemokines
1.9.6 immunogenetics; MHC structure and function, class I, II molecules; erythrocyte antigens
1.9.7 immunizations: vaccines, protective immunity
1.9.8 alterations in immunologic function
1.9.8.1 T- or B-lymphocyte deficiencies (DiGeorge syndrome)
1.9.8.2 deficiencies of phagocytic cells
1.9.8.3 combined immunodeficiency disease
1.9.8.4 HIV infection/AIDS and other acquired disorders of immune responsiveness
1.9.8.5 drug-induced alterations in immune responses, immunopharmacology
1.9.9 immunologically mediated disorders
1.9.9.1 type I, type II, type III hypersensitivity
1.9.9.2 type IV hypersensitivity
1.9.9.3 transplant and transplant rejection
1.9.9.4 autoimmune disorders
1.9.9.5 risks of transplantation, transfusion (eg, graft-versus-host disease)
1.9.9.6 isoimmunization, hemolytic disease of the newborn
1.9.9.7 immunopathogenesis
1.9.10 immunologic principles underlying diagnostic laboratory tests (eg, ELISA, complement fixation, RIA, agglutination)
1.9.11 innate immunity

1.10 Quantitative methods

1.10.1 fundamental concepts of measurement
1.10.1.1 scales of measurement
1.10.1.2 distribution, central tendency, variability, probability
1.10.1.3 disease prevalence and incidence
1.10.1.4 disease outcomes (eg, fatality rates)
1.10.1.5 associations (eg, correlation and covariance)
1.10.1.6 health impact (eg, risk differences and ratios)
1.10.1.7 sensitivity, specificity, predictive values
1.10.2 fundamental concepts of study design
1.10.2.1 types of experimental studies (eg, clinical trials, community intervention trials)
1.10.2.2 types of observational studies (eg, cohort, case-control, cross-sectional, case series, community surveys)

1.10.2.3 sampling and sample size
1.10.2.4 subject selection and exposure allocation (eg, randomization, stratification, self-selection, systematic assignment)
1.10.2.5 outcome assessment
1.10.2.6 internal and external validity
1.10.3 fundamental concepts of hypothesis testing and statistical inference
1.10.3.1 confidence intervals
1.10.3.2 statistical significance and Type I error
1.10.3.3 statistical power and Type II error

2. Hematopoietic and Lymphoreticular Systems

2.1 Normal processes

2.1.1 embryonic development, fetal maturation, and perinatal changes
2.1.2 organ structure and function
2.1.3 cell/tissue structure and function
2.1.3.1 production and function of erythrocytes, hemoglobin, O_2 and CO_2 transport, transport proteins
2.1.3.2 production and function of leukocytes and the lymphoreticular system
2.1.3.3 production and function of platelets
2.1.3.4 production and function of coagulation and fibrinolytic factors
2.1.4 repair, regeneration, and changes associated with stage of life

2.2 Abnormal processes

2.2.1 infectious, inflammatory, and immunologic disorders
2.2.1.1 infections of the blood, reticuloendothelial system, and lymphatics
2.2.1.2 allergic and anaphylactic reactions and other immunopathologic mechanisms
2.2.1.3 acquired disorders of immune deficiency
2.2.1.4 autoimmunity and autoimmune diseases (eg, Coombs positive hemolytic anemia, cryoglobulinemias, ITP)
2.2.1.5 anemia of chronic disease
2.2.1.6 transfusion complications, transplant rejection
2.2.2 traumatic and mechanical injury (eg, mechanical injury to erythrocytes, splenic rupture)
2.2.3 neoplastic disorders
2.2.3.1 lymphoma (eg, Hodgkin disease and non-Hodgkin lymphoma) and lymphocytic leukemia
2.2.3.2 acute myelocytic leukemia, myelodysplastic states
2.2.3.3 chronic myelocytic leukemia, myeloproliferative disorders
2.2.3.4 multiple myeloma, dysproteinemias, amyloidosis
2.2.4 metabolic and regulatory disorders, including acquired and congenital
2.2.4.1 anemias and cytopenias (eg, iron deficiency anemia, hemoglobinopathies, hereditary spherocytosis)
2.2.4.2 cythemia
2.2.4.3 hemorrhagic and hemostatic disorders (eg, coagulopathies, DIC)
2.2.4.4 bleeding secondary to platelet disorders (eg, von Willebrand)
2.2.5 vascular and endothelial disorders (eg, effects and complications of splenectomy, hypersplenism, TTP, hemolytic-uremic syndrome)

2.2.6 systemic disorders affecting the hematopoietic and lymphoreticular system (eg, nutritional deficiencies, systemic lupus erythematosus)
2.2.7 idiopathic disorders

2.3 Principles of therapeutics

2.3.1 mechanisms of action, use, and adverse effects of drugs for treatment of disorders of the hematopoietic system
- 2.3.1.1 blood and blood products
- 2.3.1.2 treatment of anemia, drugs stimulating erythrocyte production (eg, erythropoietin)
- 2.3.1.3 drugs stimulating leukocyte production (eg, G-CSF, GM-CSF)
- 2.3.1.4 anticoagulants, thrombolytic drugs
- 2.3.1.5 antiplatelet drugs
- 2.3.1.6 antimicrobials (eg, antimalarials, anti-HIV)
- 2.3.1.7 antineoplastic and immunosuppressive drugs
- 2.3.1.8 drugs used to treat acquired disorders of immune responsiveness

2.3.2 other therapeutic modalities (eg, splenectomy, chelating agents, radiation therapy for lymphomas, plasmapheresis)

2.4 Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental

2.4.1 emotional and behavioral factors (eg, diet, depression and immune responses, "blood doping" among athletes)
2.4.2 influence on person, family, and society (eg, childhood leukemia)
2.4.3 occupational and other environmental risk factors (eg, heavy metals, hydrocarbons, lead)
2.4.4 gender and ethnic factors (eg, herbal treatments with bone marrow depression)

3. Central and Peripheral Nervous Systems

3.1 Normal processes

3.1.1 embryonic development, fetal maturation, and perinatal changes, including neural tube derivatives, cerebral ventricles, neural crest derivatives
3.1.2 organ structure and function
- 3.1.2.1 spinal cord
  - 3.1.2.1.1 gross anatomy and blood supply
  - 3.1.2.1.2 spinal reflexes
- 3.1.2.2 brain stem
- 3.1.2.3 brain
  - 3.1.2.3.1 gross anatomy and blood supply
  - 3.1.2.3.2 higher function: cognition, language, memory
  - 3.1.2.3.3 hypothalamic function
  - 3.1.2.3.4 limbic system and emotional behavior
  - 3.1.2.3.5 circadian rhythms and sleep
  - 3.1.2.3.6 control of eye movement
- 3.1.2.4 sensory systems
  - 3.1.2.4.1 general sensory modalities, including proprioception and pain
  - 3.1.2.4.2 special sensory modalities, including vision, hearing, balance, taste, and olfaction

3.1.2.5 motor systems
3.1.2.5.1 brain and spinal cord
3.1.2.5.2 basal ganglia and cerebellum
3.1.2.6 autonomic nervous system
3.1.2.7 peripheral nerve
3.1.3 cell/tissue structure and function
3.1.3.1 axonal transport
3.1.3.2 excitable properties of neurons, axons and dendrites, including channels
3.1.3.3 synthesis, storage, release, reuptake, and degradation of neurotransmitters and neuromodulators
3.1.3.4 pre- and postsynaptic receptor interactions, trophic and growth factors
3.1.3.5 brain metabolism
3.1.3.6 glia, myelin
3.1.3.7 brain homeostasis: blood-brain barrier; cerebrospinal fluid formation and flow; choroid plexus
3.1.4 repair, regeneration, and changes associated with stage of life

3.2 Abnormal processes

3.2.1 infectious, inflammatory, and immunologic disorders
3.2.1.1 infectious disorders (eg, meningitis, abscess, encephalitis)
3.2.1.2 demyelinating disorders, including multiple sclerosis, Guillain-Barré syndrome
3.2.1.3 myasthenia gravis
3.2.1.4 eye and ear (eg, conjunctivitis, otitis media)
3.2.2 traumatic and mechanical disorders (eg, subdural and epidural hematomas, cord compression, peripheral nerve injury)
3.2.3 neoplastic disorders
3.2.3.1 primary (eg, meningioma, astrocytoma)
3.2.3.2 metastatic
3.2.4 acquired metabolic and regulatory disorders (eg, delirium, ~~Reye syndrome~~)
3.2.5 vascular disorders (eg, cerebrovascular occlusion, venous sinus thrombosis, arterial aneurysms, hemorrhage**)**
3.2.6 systemic disorders affecting the nervous system (eg, lupus, diabetic neuropathy)
3.2.7 idiopathic disorders affecting the nervous system
3.2.8 congenital disorders, including metabolic (eg, neural tube defects, cerebral palsy, mental retardation, Down syndrome)
3.2.9 degenerative disorders (eg, peripheral neuropathy, Alzheimer dementia, Parkinson disease, Huntington disease, amyotrophic lateral sclerosis)
3.2.10 paroxysmal disorders (eg, epilepsy, headache, sleep disorders [narcolepsy, restless legs syndrome/periodic limb movement, circadian rhythm disorders, parasomnias], pain syndromes)
3.2.11 disorders of special senses (eg, blindness, deafness)
3.2.12 psychopathologic disorders, processes and their evaluation
3.2.12.1 early-onset disorders (eg, learning disorders)
3.2.12.2 disorders related to substance use
3.2.12.3 schizophrenia and other psychotic disorders
3.2.12.4 mood disorders

3.2.12.5 anxiety disorders
3.2.12.6 somatoform disorders
3.2.12.7 personality disorders
3.2.12.8 physical and sexual abuse of children, adults, and elders
3.2.12.9 other disorders (eg, dissociative, impulse control)

3.3 Principles of therapeutics

3.3.1 mechanisms of action, use, and adverse effects of drugs for treatment of disorders of the nervous system
3.3.1.1 anesthetics
3.3.1.2 hypnotics
3.3.1.3 psychopharmacologic agents (eg, anxiolytics, antidepressants, antipsychotic agents, mood-stabilizing agents)
3.3.1.4 anticonvulsants
3.3.1.5 analgesics
3.3.1.6 stimulants, amphetamines
3.3.1.7 antiparkinsonian drugs
3.3.1.8 skeletal muscle relaxants; botulinum toxin
3.3.1.9 neuromuscular junction blocking agents (including postsynaptic)
3.3.1.10 antiglaucoma drugs
3.3.1.11 drugs used to decrease intracranial pressure (eg, mannitol, high-dose glucocorticoids)
3.3.1.12 antimigraine agents
3.3.1.13 drugs affecting autonomic nervous system (eg, anticholinesterases)
3.3.2 other therapeutic modalities (eg, radiation, CFS shunting, surgery)

3.4 Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental

3.4.1 emotional and behavioral factors (eg, drug abuse, dementia, sleep deprivation, accident prevention, pets)
3.4.2 influence on person, family, and society (eg, developmental disabilities, dementia, generation reversal, nutrition, seizures, sleep disorders)
3.4.3 occupational and other environmental risk factors (eg, boxing, carbon monoxide exposure)
3.4.4 gender and ethnic factors

4. Skin and Related Connective Tissue

4.1 Normal processes

4.1.1 embryonic development, fetal maturation, and perinatal changes
4.1.2 organ structure and function
4.1.3 cell/tissue structure and function, including barrier functions, thermal regulation, eccrine function
4.1.4 repair, regeneration, and changes associated with stage of life or ethnicity (eg, senile purpura, male pattern baldness, postmenopausal hair changes)
4.1.5 skin defense mechanisms and normal flora

4.2 Abnormal processes

4.2.1 infectious, inflammatory, and immunologic disorders

4.2.1.1 bacterial infections (eg, acne, cellulitis, carbuncle, abscess, necrotizing fasciitis, gangrene)
4.2.1.2 viral infections (eg, herpes infections, chickenpox, rubella, measles, roseola, verrucae)
4.2.1.3 fungal infections, including mycoses, dermatophytosis (eg, tinea)
4.2.1.4 parasitic infections (eg, scabies, lice)
4.2.1.5 immune and autoimmune disorders (eg, discoid lupus erythematosus, scleroderma, dermatomyositis, alopecia, psoriasis, urticaria, allergic dermatosis)

4.2.2 traumatic and mechanical disorders
4.2.2.1 thermal injury
4.2.2.2 decubitus ulcers
4.2.2.3 effects of ultraviolet light and radiation

4.2.3 neoplastic disorders
4.2.3.1 keratinocytes (eg, seborrheic keratosis, actinic keratosis, basal cell carcinoma, squamous cell carcinoma, ichthyosis)
4.2.3.2 melanocytes (eg, nevi, melanoma)
4.2.3.3 vascular neoplasms (eg, hemangiomas, Kaposi sarcoma)
4.2.3.4 other (eg, T-cell lymphoma, skin appendage tumors)

4.2.4 metabolic, regulatory, and structural disorders, (eg, vitamin deficiencies, hypervitaminosis, hyperhidrosis)
4.2.5 vascular disorders (eg, vasculitis, Raynaud disease)
4.2.6 systemic disorders affecting the skin (eg, Ehlers-Danlos syndrome, Marfan syndrome)

4.3 Principles of therapeutics

4.3.1 mechanisms of action, use, and adverse effects of drugs for treatment of disorders of the skin and connective tissue
4.3.1.1 anti-inflammatory agents (eg, corticosteroids, antihistamines)
4.3.1.2 emollients
4.3.1.3 sunscreen
4.3.1.4 retinoids
4.3.1.5 antimicrobial agents
4.3.1.6 cytotoxic and immunologic therapy (eg, methotrexate, PUVA, keratinolytics)

4.3.2 other therapeutic modalities (eg, laser, tattoo removal, cryotherapy)

4.4 Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental

4.4.1 emotional and behavioral factors (eg, sun exposure, acne)
4.4.2 influence on person, family, and society (eg, psoriasis)
4.4.3 occupational and other environmental risk factors
4.4.4 gender and ethnic factors (eg, keloid)

5. Musculoskeletal System

5.1 Normal processes

5.1.1 embryonic development, fetal maturation, and perinatal changes
5.1.2 organ structure and function
5.1.3 cell/tissue structure and function

5.1.3.1 biology of bones, joints, tendons, skeletal muscle
5.1.3.2 exercise and physical conditioning
5.1.4 repair, regeneration, and changes associated with stage of life

5.2 Abnormal processes

5.2.1 infectious, inflammatory, and immunologic disorders
5.2.1.1 infectious disorders (eg, septic arthritis, Lyme disease, osteomyelitis)
5.2.1.2 inflammatory disorders (eg, fibrositis, synovitis, tenosynovitis) (includes costochondritis)
5.2.1.3 immunologic disorders (eg, rheumatoid arthritis, ankylosing spondylitis, polymyositis, systemic lupus erythematosus, dermatomyositis, polymyalgia rheumatica)
5.2.2 traumatic and mechanical disorders
5.2.2.1 fractures
5.2.2.2 sprains, strains, dislocations
5.2.2.3 repetitive motion injuries (eg, carpal tunnel syndrome)
5.2.3 neoplastic disorders (eg, osteosarcoma, metastatic disease)
5.2.4 metabolic, regulatory, and structural disorders
5.2.4.1 disorders of musculoskeletal development (eg, dwarfism, osteogenesis imperfecta)
5.2.4.2 osteomalacia, osteoporosis, osteodystrophy
5.2.4.3 gout
5.2.4.4 muscular dystrophy
5.2.5 vascular disorders (eg, polyarteritis nodosa, bone infarcts)
5.2.6 systemic disorders affecting the musculoskeletal system (eg, diabetes mellitus)
5.2.7 idiopathic disorders (eg, Dupuytren contracture, scoliosis, Paget disease)
5.2.8 degenerative disorders (eg, disc disease, osteoarthritis)

5.3 Principles of therapeutics

5.3.1 mechanisms of action, use, and adverse effects of drugs for treatment of disorders of the musculoskeletal system
5.3.1.1 nonsteroidal anti-inflammatory drugs and analgesics
5.3.1.2 muscle relaxants
5.3.1.3 antigout therapy (eg, allopurinol, colchicine, uricosuric drugs)
5.3.1.4 immunosuppressive drugs (eg, glucocorticoids, gold, cytotoxic agents)
5.3.1.5 drugs affecting bone mineralization (eg, bisphosphonates, calcitonin, estrogen analogs)
5.3.2 other therapeutic modalities (eg, radiation, surgery, casts, rehabilitation)

5.4 Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental

5.4.1 emotional and behavioral factors (eg, diet, exercise, seat belts, bicycle helmets)
5.4.2 influence on person, family, and society (eg, osteoporosis, fractures in elderly, alcohol abuse and fractures)
5.4.3 occupational and other environmental risk factors (eg, athletes, musicians)
5.4.4 gender and ethnic factors (eg, bone mass)

6. Respiratory System

6.1 Normal processes

- 6.1.1 embryonic development, fetal maturation, and perinatal changes
- 6.1.2 organ structure and function
  - 6.1.2.1 airways, including mechanics and regulation of breathing
  - 6.1.2.2 lung parenchyma, including ventilation, perfusion, gas exchange
  - 6.1.2.3 pleura
  - 6.1.2.4 nasopharynx, sinuses
- 6.1.3 cell/tissue structure and function, including surfactant formation, alveolar structure
- 6.1.4 repair, regeneration, and changes associated with stage of life
- 6.1.5 pulmonary defense mechanisms and normal flora

6.2 Abnormal processes

- 6.2.1 infectious, inflammatory, and immunologic disorders
  - 6.2.1.1 infectious diseases
    - 6.2.1.1.1 infectious diseases of the upper respiratory tract (eg, sinusitis, pharyngitis)
    - 6.2.1.1.2 acute infectious diseases of the lower respiratory tract and pleura and their complications (eg, pneumonia, bronchiectasis, abscess, empyema)
    - 6.2.1.1.3 chronic infectious diseases of the lower respiratory tract (eg, Mycobacterium, endemic fungal infections, Nocardia/ Actinomyces)
  - 6.2.1.2 immunologic disorders
    - 6.2.1.2.1 allergic and hypersensitivity disorders (eg, asthma)
    - 6.2.1.2.2 autoimmune disorders (eg, Wegener granulomatosis, Goodpasture syndrome)
  - 6.2.1.3 inflammatory disorders
    - 6.2.1.3.1 pneumoconioses
    - 6.2.1.3.2 acute and chronic alveolar injury (eg, acute respiratory distress syndrome, chlorine gas/smoke inhalation)
    - 6.2.1.3.3 obstructive pulmonary disease
    - 6.2.1.3.4 restrictive pulmonary disease (eg, sarcoidosis, idiopathic fibrosis)
- 6.2.2 traumatic and mechanical disorders (eg, foreign body aspiration, pneumothorax, atelectasis, sleep apnea)
- 6.2.3 neoplastic disorders
  - 6.2.3.1 upper airway (eg, polyps)
  - 6.2.3.2 lower airway and lung parenchyma (eg, bronchogenic carcinoma, carcinoid tumors, bronchial adenoma)
  - 6.2.3.3 pleura (eg, mesothelioma)
  - 6.2.3.4 metastatic tumors
- 6.2.4 metabolic, regulatory, and structural disorders (eg, hypoventilation, disorders of gas exchange, ventilation-perfusion imbalance, neonatal respiratory distress syndrome)
- 6.2.5 vascular and circulatory disorders
  - 6.2.5.1 thromboembolic disease

6.2.5.2 pulmonary hypertension
6.2.5.3 pulmonary edema
6.2.5.4 pleural effusion
6.2.6 systemic disorders affecting the respiratory system

6.3 Principles of therapeutics

6.3.1 mechanisms of action, use, and adverse effects of drugs for treatment of disorders of the respiratory system
6.3.1.1 decongestants, cough suppressants, expectorants, mucolytics
6.3.1.2 bronchodilator drugs
6.3.1.3 anti-inflammatory and cytotoxic drugs
6.3.1.4 antimicrobial agents
6.3.1.5 antineoplastic agents
6.3.2 other therapeutic modalities (eg, oxygen therapy, nasal CPAP, mechanical ventilation, physical therapy, surgical procedures, including transplantation)

6.4 Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental

6.4.1 emotional and behavioral factors (eg, smoking, substance abuse, pets and allergies)
6.4.2 influence on person, family, and society (eg, tuberculosis, asthma, chronic obstructive pulmonary disease, school issues, protective parents, family smoking)
6.4.3 occupational and other environmental risk factors
6.4.4 gender and ethnic factors (eg, sarcoidosis, lung cancer)

7. Cardiovascular System

7.1 Normal processes

7.1.1 embryonic development, fetal maturation, and perinatal changes
7.1.2 organ structure and function
7.1.2.1 chambers, valves
7.1.2.2 cardiac cycle, mechanics, heart sounds, cardiac conduction
7.1.2.3 hemodynamics, including systemic, pulmonary, coronary, and blood volume
7.1.2.4 circulation in specific vascular beds
7.1.3 cell/tissue structure and function
7.1.3.1 heart muscle, metabolism, oxygen consumption, biochemistry, and secretory function (eg, atrial natriuretic peptide)
7.1.3.2 endothelium and secretory function, vascular smooth muscle, microcirculation, and lymph flow
7.1.3.2.1 mechanisms of atherosclerosis
7.1.3.3 neural and hormonal regulation of the heart, blood vessels, and blood volume, including responses to change in posture, exercise, and tissue metabolism
7.1.4 repair, regeneration, and changes associated with stage of life

7.2 Abnormal processes

7.2.1 infectious, inflammatory, and immunologic disorders
7.2.1.1 infectious disorders (eg, endocarditis, myocarditis, pericarditis)

7.2.1.2 inflammatory and immunologic disorders (eg, acute rheumatic fever, systemic lupus erythematosus, vasculitis, temporal arteritis)
7.2.2 traumatic and mechanical disorders (eg, tamponade, valvular disease, obstructive cardiomyopathy)
7.2.3 neoplastic disorders
7.2.4 metabolic and regulatory disorders
7.2.4.1 dysrhythmias
7.2.4.2 systolic and diastolic dysfunction, low- and high-output heart failure, cor pulmonale (eg, dilated cardiomyopathies)
7.2.4.3 systemic hypertension
7.2.4.4 ischemic heart disease, myocardial infarction
7.2.4.5 systemic hypotension and shock
7.2.5 vascular disorders (eg, aneurysms, occlusions, varicosities, atherosclerosis)
7.2.6 systemic diseases affecting the cardiovascular system (eg, amyloidosis, aortic dissection with Marfan syndrome, scleroderma)
7.2.7 congenital disorders of the heart and central vessels

7.3 Principles of therapeutics
7.3.1 mechanisms of action, use, and adverse effects of drugs for treatment of disorders of the cardiovascular system
7.3.1.1 coronary and peripheral vasodilators
7.3.1.2 antiarrhythmic drugs
7.3.1.3 antihypertensive drugs
7.3.1.4 measures used to combat hypotension and shock
7.3.1.5 drugs affecting cholesterol and lipid metabolism
7.3.1.6 drugs affecting blood coagulation, thrombolytic agents
7.3.1.7 inotropic agents and treatment of heart failure
7.3.1.8 immunosuppressive and antimicrobial drugs
7.3.1.9 drugs to treat peripheral arterial disease
7.3.2 other therapeutic modalities (eg, pacemakers, angioplasty, valves, grafts, other surgical procedures)

7.4 Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental
7.4.1 emotional and behavioral factors (eg, smoking, alcohol, ischemic heart disease, obesity, exercise, diet)
7.4.2 influence on person, family, and society (eg, altered lifestyle)
7.4.3 occupational and other environmental risk factors (eg, stress)
7.4.4 gender and ethnic factors (eg, hypertension)

8. Gastrointestinal System

8.1 Normal processes
8.1.1 embryonic development, fetal maturation, and perinatal changes
8.1.2 organ structure and function
8.1.2.1 anatomy of alimentary canal, including mouth, pharynx, esophagus, stomach, small intestine, large intestine, anus
8.1.2.2 liver and biliary system, including enterohepatic circulation
8.1.2.3 salivary glands and exocrine pancreas
8.1.2.4 motility, including vomiting and defecation

8.1.2.5 digestion and absorption

8.1.3 cell/tissue structure and function

8.1.3.1 endocrine and neural regulatory functions, including GI hormones (eg, gastrin)

8.1.3.2 salivary, gastrointestinal, pancreatic, hepatic secretory products, including enzymes, proteins, bile salts, and processes

8.1.3.3 synthetic and metabolic functions of hepatocytes

8.1.4 repair, regeneration, and changes associated with stage of life

8.1.5 gastrointestinal defense mechanisms and normal flora

8.2 Abnormal processes

8.2.1 infectious, inflammatory, and immunologic disorders

8.2.1.1 infectious disorders (eg, peritonitis, hepatitis, gingivostomatitis, peptic ulcer, gastritis, esophagitis, traveler's diarrhea, food poisoning)

8.2.1.2 inflammatory disorders (eg, cholecystitis, pancreatitis)

8.2.1.3 immunologic disorders (eg, Crohn disease, ulcerative colitis)

8.2.2 traumatic and mechanical disorders

8.2.2.1 malocclusion

8.2.2.2 hiatal hernia

8.2.2.3 obstruction (eg, volvulus, intussusception, esophageal atresia, annular pancreas, postsurgical obstruction)

8.2.2.4 perforation of hollow viscus and blunt trauma

8.2.2.5 inguinal, femoral, and abdominal wall hernias

8.2.2.6 esophageal and intestinal diverticula (eg, Meckel diverticulum)

8.2.3 neoplastic disorders

8.2.3.1 benign (eg, polyps)

8.2.3.2 malignant

8.2.4 metabolic and regulatory disorders

8.2.4.1 motility disorders (eg, esophageal reflux, neuropathy, achalasia, irritable bowel syndrome, paralytic ileus, Hirschsprung disease)

8.2.4.2 malabsorption (eg, pancreatic insufficiency, sprue, lactose intolerance)

8.2.4.3 hepatic failure, jaundice, encephalopathy, cirrhosis, ascites, biliary atresia)

8.2.4.4 cholelithiasis, cholestasis

8.2.5 vascular disorders

8.2.5.1 portal hypertension and esophageal varices

8.2.5.2 hemorrhoids, anal fissure

8.2.5.3 ischemia, angiodysplasia, thromboses, vasculitis

8.2.6 systemic disorders affecting the gastrointestinal system

8.3 Principles of therapeutics

8.3.1 mechanisms of action, use, and adverse effects of drugs for treatment of disorders of the gastrointestinal system

8.3.1.1 treatment and prophylaxis of peptic ulcer disease and gastroesophageal reflux (eg, antacids, antisecretory drugs, mucosal protective agents, antibiotics)

8.3.1.2 drugs to alter gastrointestinal motility (eg, cathartics, antidiarrheal drugs, antiemetic drugs, prokinetic drugs)

8.3.1.3 fluid replacement (eg, oral rehydration)
8.3.1.4 pancreatic replacement therapy and treatment of pancreatitis
8.3.1.5 drugs for treatment of hepatic failure (eg, lactulose) and biliary disease (eg, drugs to dissolve gallstones)
8.3.1.6 anti-inflammatory, immunosuppressive, antineoplastic, and antimicrobial drugs
8.3.2 other therapeutic modalities (eg, surgical procedures, stents, feeding tubes)

8.4 Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental
8.4.1 emotional and behavioral factors (eg, peptic ulcer, encopresis, Monday morning stomach)
8.4.2 influence on person, family, and society (eg, inflammatory bowel disease, irritable bowel disease, pancreatitis and alcohol, chronic laxative abuse)
8.4.3 occupational and other environmental risk factors
8.4.4 gender and ethnic factors (eg, diets)

9. Renal/urinary System

9.1 Normal processes
9.1.1 embryonic development, fetal maturation, and perinatal changes
9.1.2 organ structure and function
9.1.2.1 kidneys, ureters, bladder, urethra
9.1.2.2 glomerular filtration and hemodynamics
9.1.2.3 tubular reabsorption and secretion, including transport processes and proteins
9.1.2.4 urinary concentration and dilution
9.1.2.5 renal mechanisms in acid-base balance
9.1.2.6 renal mechanisms in body fluid homeostasis
9.1.2.7 micturition
9.1.3 cell/tissue structure and function
9.1.3.1 renal metabolism and oxygen consumption
9.1.3.2 hormones produced by or acting on the kidney
9.1.4 repair, regeneration, and changes associated with stage of life

9.2 Abnormal processes
9.2.1 infectious, inflammatory, and immunologic disorders
9.2.1.1 infectious disorders
9.2.1.1.1 upper urinary tract (eg, pyelonephritis, papillary necrosis)
9.2.1.1.2 lower urinary tract (eg, cystitis, urethritis)
9.2.1.2 inflammatory and immunologic disorders
9.2.1.2.1 glomerular disorders (eg, glomerulonephritis, nephrotic syndrome, IgA nephropathy)
9.2.1.2.2 tubular interstitial disease (eg, interstitial nephritis)
9.2.2 traumatic and mechanical disorders (eg, obstructive uropathy)
9.2.3 neoplastic disorders
9.2.3.1 primary
9.2.3.1.1 renal
9.2.3.1.2 urinary bladder and collecting system

9.2.3.2 metastases
9.2.4 metabolic and regulatory disorders
9.2.4.1 renal failure, acute and chronic (eg, acute tubular necrosis)
9.2.4.2 tubular and collecting duct disorders (eg, Fanconi syndrome, renal tubular acidosis, nephrogenic diabetes insipidus, polycystic kidney disease)
9.2.4.3 renal calculi
9.2.5 vascular disorders (eg, renal artery stenosis)
9.2.6 systemic diseases affecting the renal system (eg, diabetes mellitus, hepatitis, amyloid, systemic lupus erythematosus, Wegener granulomatosis)

9.3 Principles of therapeutics
9.3.1 mechanisms of action, use, and adverse effects of drugs for treatment of disorders of the renal and urinary system
9.3.1.1 diuretics, antidiuretic drugs
9.3.1.2 drugs and fluids used to treat volume, electrolyte, and acid-base disorders
9.3.1.3 drugs used to enhance renal perfusion (eg, dopamine)
9.3.1.4 anti-inflammatory, antimicrobial, immunosuppressive, and antineoplastic drugs
9.3.1.5 drugs used to treat lower urinary tract system (eg, incontinence, bladder function, benign prostatic hyperplasia)
9.3.2 other therapeutic modalities (eg, dialysis, renal transplantation)

9.4 Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental
9.4.1 emotional and behavioral factors (eg, drug-induced interstitial nephritis, diet)
9.4.2 influence on person, family, and society (eg, hemodialysis, living related kidney donation, transplants)
9.4.3 occupational and other environmental risk factors (eg, heavy metals)
9.4.4 gender and ethnic factors (eg, disease progression, urinary tract infections)

10. Reproductive System

10.1 Normal processes
10.1.1 embryonic development, fetal maturation, and perinatal changes
10.1.2 organ structure and function
10.1.2.1 female structure, including breast
10.1.2.2 female function (eg, menstrual cycle, puberty, menopause)
10.1.2.3 male structure
10.1.2.4 male function (eg, spermatogenesis, puberty)
10.1.2.5 intercourse, orgasm
10.1.2.6 pregnancy, ovulation, fertilization, implantation, including labor and delivery, the puerperium, lactation, gestational uterus, placenta
10.1.3 cell/tissue structure and function, including hypothalamic-pituitary-gonadal axis, sex steroids, gestational hormones
10.1.4 reproductive system defense mechanisms and normal flora

10.2 Abnormal processes
10.2.1 infectious, inflammatory, and immunologic disorders

10.2.1.1 infectious disorders (eg, toxic shock syndrome, breast abscess, orchitis)
10.2.1.1.1 sexually transmitted diseases
10.2.1.2 immunologic and inflammatory disorders (eg, autoimmune hypogonadism, cystic mastitis)
10.2.2 traumatic and mechanical disorders
10.2.2.1 female incontinence, prolapse, cystocele
10.2.2.2 torsion of testis, varicocele, circumcision, phimosis
10.2.3 neoplastic disorders
10.2.3.1 female reproductive (eg, cervix, ovary)
10.2.3.2 male reproductive (eg, prostate)
10.2.3.3 breast, including fibrocystic changes
10.2.3.4 trophoblastic disease
10.2.4 metabolic and regulatory processes
10.2.4.1 female (eg, anovulation, infertility, polycystic ovaries, endometriosis, orgasmic dysfunction, delayed and premature puberty)
10.2.4.1.1 menopausal syndrome
10.2.4.2 male (eg, infertility, impotence, gynecomastia, delayed and premature puberty)
10.2.4.2.1 benign prostatic hyperplasia
10.2.5 systemic disorders affecting reproductive function (eg, obesity, myotonic dystrophy, cirrhosis, renal failure)
10.2.6 Reserved
10.2.7 disorders relating to pregnancy, the puerperium, and the postpartum period
10.2.7.1 obstetric problems (eg, ectopic pregnancy, third-trimester bleeding)
10.2.7.2 complications affecting other organ systems (eg, eclampsia, gestational diabetes, thyroid disorders)
10.2.7.3 disorders associated with the puerperium (eg, postpartum hemorrhage, sepsis, depression)
10.2.7.4 antepartum, intrapartum, postpartum disorders of the fetus (eg, prematurity, postmaturity, cord compression, macrosomia)

10.3 Principles of therapeutics

10.3.1 mechanisms of action, use, and adverse effects of drugs for treatment of disorders of the reproductive system and management of normal reproductive function
10.3.1.1 female reproductive tract
10.3.1.1.1 fertility drugs
10.3.1.1.2 oral contraception, other methods of contraception (eg, condoms)
10.3.1.1.3 estrogen, progestogen replacement, treatment of menopause
10.3.1.1.4 stimulants and inhibitors of labor
10.3.1.1.5 estrogen and progesterone antagonists
10.3.1.1.6 stimulators and inhibitors of lactation
10.3.1.2 male reproductive tract
10.3.1.2.1 fertility drugs
10.3.1.2.2 androgen replacement and antagonists
10.3.1.3 gonadotropin-releasing hormone and gonadotropin replacement

10.3.1.4 abortifacients
10.3.1.5 antimicrobials
10.3.1.6 antineoplastics
10.3.1.7 restoration of potency
10.3.2 other therapeutic modalities affecting the reproductive system (eg, tampons)

10.4 Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental
10.4.1 emotional and behavioral factors (eg, sexually transmitted diseases)
10.4.2 influence on person, family, and society (eg, infertility)
10.4.3 occupational and other environmental risk factors (eg, radiation)
10.4.4 family planning and pregnancy (eg, unwanted)
10.4.5 gender identity, sexual orientation, sexuality, libido
10.4.6 effects of traumatic stress syndrome, violence, rape, child abuse

11. Endocrine System

11.1 Normal processes
11.1.1 embryonic development, fetal maturation, and perinatal changes
11.1.2 organ structure and function
11.1.2.1 hypothalamus, posterior and anterior pituitary gland
11.1.2.2 thyroid gland
11.1.2.3 parathyroid glands
11.1.2.4 adrenal cortex, adrenal medulla
11.1.2.5 pancreatic islets
11.1.2.6 ovary and testis
11.1.2.7 adipose tissue
11.1.3 cell/tissue structure and function, including hormone synthesis, secretion, action, and metabolism
11.1.3.1 peptide hormones
11.1.3.2 steroid hormones, including vitamin D
11.1.3.3 thyroid hormones
11.1.3.4 catecholamine hormones
11.1.3.5 renin-angiotensin system
11.1.4 repair, regeneration, and changes associated with stage of life

11.2 Abnormal processes
11.2.1 infectious, inflammatory, and immunologic disorders
11.2.1.1 infectious disorders (eg, subacute thyroiditis, mumps)
11.2.1.2 immunologic disorders (eg, Graves disease, Hashimoto disease)
11.2.1.3 inflammatory disorders (eg, sarcoidosis)
11.2.2 traumatic and mechanical disorders
11.2.3 neoplastic disorders
11.2.3.1 pituitary (including craniopharyngioma)
11.2.3.2 thyroid
11.2.3.3 parathyroid
11.2.3.4 adrenal cortex
11.2.3.5 pancreatic islets
11.2.3.6 neural crest, pheochromocytoma
11.2.4 metabolic and regulatory processes

11.2.4.1 diabetes mellitus (types I and II), ketoacidosis, hyperosmolar coma
11.2.4.2 pituitary, hypothalamus (eg, central diabetes insipidus, syndrome of inappropriate secretion of ADH, hypopituitarism, acromegaly)
11.2.4.3 thyroid (eg, hypothyroidism, thyrotoxicosis), euthyroid sick syndrome
11.2.4.4 parathyroid (eg, hyperparathyroidism, hypoparathyroidism), hypocalcemia, hypercalcemia, metabolic bone disorders
11.2.4.5 pancreatic islet disorders (eg, hyperinsulinism)
11.2.4.6 adrenal disorders (eg, Cushing syndrome, adrenocortical insufficiency, hyperaldosteronism)
11.2.5 vascular disorders (eg, pituitary apoplexy)
11.2.6 systemic disorders affecting the endocrine system
11.2.7 idiopathic disorders (eg, hirsutism)

11.3 Principles of therapeutics

11.3.1 mechanisms of action, use, and adverse effects of drugs for treatment of disorders of the endocrine system
11.3.1.1 hormones and hormone analogs
11.3.1.2 stimulators of hormone production (eg, sulfonylureas)
11.3.1.3 inhibitors of hormone production (eg, thiouracils)
11.3.1.4 hormone antagonists
11.3.1.5 potentiators of hormone action (eg, thiazolidinediones)
11.3.1.6 antiobesity agents
11.3.2 other therapeutic modalities (eg, surgery, radiation)

11.4 Gender, ethnic, and behavioral considerations affecting disease treatment and prevention, including psychosocial, cultural, occupational, and environmental

11.4.1 emotional and behavioral factors (eg, compliance in diabetes mellitus, factitious use of insulin, psychogenic polydipsia)
11.4.2 influence on person, family, and society
11.4.3 occupational and other environmental risk factors (eg, radiation exposure, iodine deficiency)
11.4.4 gender and ethnic factors