UNIT TERMINAL OBJECTIVE

1-7 At the completion of this unit, the paramedic student will be able to integrate pathophysiological principles of pharmacology and the assessment findings to formulate a field impression and implement a pharmacologic management plan.

COGNITIVE OBJECTIVES

At the completion of this unit, the paramedic student will be able to:

1-7.1 Describe historical trends in pharmacology. (C-1)
1-7.2 Differentiate among the chemical, generic (nonproprietary), and trade (proprietary) names of a drug. (C-3)
1-7.3 List the four main sources of drug products. (C-1)
1-7.4 Describe how drugs are classified. (C-1)
1-7.5 List the authoritative sources for drug information. (C-1)
1-7.6 List legislative acts controlling drug use and abuse in the United States. (C-1)
1-7.7 Differentiate among Schedule I, II, III, IV, and V substances. (C-3)
1-7.8 List examples of substances in each schedule. (C-1)
1-7.9 Discuss standardization of drugs. (C-1)
1-7.10 Discuss investigational drugs, including the Food and Drug Administration (FDA) approval process and the FDA classifications for newly approved drugs. (C-1)
1-7.11 Discuss special consideration in drug treatment with regard to pregnant, pediatric and geriatric patients. (C-1)
1-7.12 Discuss the paramedic's responsibilities and scope of management pertinent to the administration of medications. (C-1)
1-7.13 Review the specific anatomy and physiology pertinent to pharmacology with additional attention to autonomic pharmacology. (C-1)
1-7.14 List and describe general properties of drugs. (C-1)
1-7.15 List and describe liquid and solid drug forms. (C-1)
1-7.16 List and differentiate routes of drug administration. (C-3)
1-7.17 Differentiate between enteral and parenteral routes of drug administration. (C-3)
1-7.18 Describe mechanisms of drug action. (C-1)
1-7.19 List and differentiate the phases of drug activity, including the pharmaceutical, pharmacokinetic, and pharmacodynamic phases. (C-3)
1-7.20 Describe the process called pharmacokinetics, pharmocodynamics, including theories of drug action, drug-response relationship, factors altering drug responses, predictable drug responses, iatrogenic drug responses, and unpredictable adverse drug responses. (C-1)
1-7.21 Differentiate among drug interactions. (C-3)
1-7.22 Discuss considerations for storing and securing medications. (C-1)
1-7.23 List the component of a drug profile by classification. (C-1)
1-7.24 List and describe drugs that the paramedic may administer according to local protocol. (C-1)
1-7.25 Integrate pathophysiological principles of pharmacology with patient assessment. (C-3)
1-7.26 Synthesize patient history information and assessment findings to form a field impression. (C-3)
1-7.27 Synthesize a field impression to implement a pharmacologic management plan. (C-3)
1-7.28 Assess the pathophysiology of a patient's condition by identifying classifications of drugs. (C-3)

AFFECTIVE OBJECTIVES

At the completion of this unit, the paramedic student will be able to:

1-7.29 Serve as a model for obtaining a history by identifying classifications of drugs. (A-3)

1-7.30 Defend the administration of drugs by a paramedic to affect positive therapeutic affect. (A-3)
1-7.31 Advocate drug education through identification of drug classifications. (A-3)

PSYCHOMOTOR OBJECTIVES
None identified for this unit.

DECLARATIVE

I. Historical trends in pharmacology
- A. Ancient health care
- B. The pre- and post-renaissance period
- C. Modern health care
- D. The present period of change
- E. New trends in health care and pharmaceutics
  1. Expansion of consumer health education results from the consumer's motivation to take responsibility for their health and disease prevention
  2. Research is directed to discover new treatments, cures, or methods to prevent disease processes that limit growth, everyday living, or average life span
  3. Orphan drugs developed to treat rare and chronic diseases

II. Names of drugs
- A. Drugs - chemical agents used in the diagnosis, treatment, or prevention of disease
- B. Pharmacology - the study of drugs and their actions on the body
- C. Chemical name - a precise description of the drug's chemical composition and molecular structure
- D. Generic name or non-proprietary name
  1. Official name approved by the FDA
  2. Usually suggested by the first manufacturer
- E. Trade or proprietary name - the brand name registered to a specific manufacturer or owner
- F. Official name - the name assigned by USP

III. Sources of drugs
- A. Plants
  1. Alkaloids
  2. Glycosides
  3. Gums
  4. Oils
- B. Animals and humans
- C. Minerals or mineral products
- D. Chemical substances made in the laboratory

IV. Drug Classification
- A. Drugs are classified
  1. By body system
  2. Class of agent
  3. Mechanism of action

V. Sources of drug information
- A. AMA Drug Evaluation
- B. Physician's Desk Reference (PDR)
- C. Hospital Formulary (HF)
- D. Drug inserts
- E. Other texts, sources

VI. United States drug legislation

A. Purpose for drug legislation
    1. To protect the public from adulterated or mislabeled drugs
B. History of drug legislation and its effects
    1. Pure Food and Drug Act, 1906
    2. Harrison Narcotic Act, 1914
    3. Federal Food, Drug, and Cosmetic Act, 1938
C. Food and Drug Administration

VII. Schedule of controlled substances
A. Controlled Substances Act, 1970 (Comprehensive Drug Abuse Prevention and Control Act, 1970)
B. Purpose for scheduling controlled substances, based upon abuse potential
C. Classification of drugs into numbered levels or schedules (I to V)
D. Schedules
    1. Schedule I
        a. High abuse potential
        b. No currently accepted medical use
            (1) For research, analysis, or instruction only
            (2) May lead to severe dependence
        c. Examples
            (1) Heroin
            (2) LSD
            (3) Mescaline
    2. Schedule II
        a. High abuse potential
        b. Accepted medical uses; may lead to severe physical and/ or psychological dependence
        c. Examples
            (1) Opium
            (2) Morphine
            (3) Codeine
            (4) Oxycodone
            (5) Methadone
            (6) Cocaine
            (7) Secobarbital
    3. Schedule III
        a. Less abuse potential than drugs in Schedules I and II
        b. Accepted medical uses - may lead to moderate/ low physical dependence or high psychologic dependence
        c. Examples
            (1) Preparations containing limited opioid quantities, or combined with one or more active ingredients that are noncontrolled substances
                (a) Acetaminophen with codeine
                (b) Aspirin with codeine
    4. Schedule IV
        a. Lower abuse potential compared to Schedule III
        b. Accepted medical uses - may lead to limited physical or psychological dependence
        c. Examples

(1) Phenobarbital
(2) Diazepam
(3) Lorazepam

5. Schedule V
   a. Low abuse potential compared to schedule IV
   b. Accepted medical uses - may lead to limited physical or psychologic dependence
   c. Examples
      (1) Medications, generally for relief of coughs or diarrhea, containing limited quantities of certain opioid controlled substances

VIII. Standardization of drugs
- A. Standardization is a necessity
- B. Techniques for measuring a drug's strength and purity
  1. Assay
  2. Bioassay
- C. The Unites States Pharmacopeia (USP)
  1. Official volumes of drug standards
- D. Other reference books and guides

IX. Investigational drugs
- A. Prospective drugs may take years to progress through the FDA testing sequence
  1. Animal studies to ascertain
     a. Toxicity
     b. Therapeutic index
     c. Modes of absorption, distribution, metabolism (biotransformation), and excretion
  2. Human studies
- B. FDA approval process
  1. Phases of investigation
  2. New drug application
  3. Abbreviated new drug application
- C. FDA classifications for newly approved drugs, 1992
  1. Numerical classification
  2. Letter classification

X. Special considerations in drug therapy
- A. Pregnant patients
  1. Before using any drug during pregnancy, the expected benefits should be considered against the possible risks to the fetus
  2. The FDA has established a scale (Categories A, B, C, D, and X) to indicate drugs that may have documented problems in animals and/ or humans during pregnancy
  3. Many drugs are unknown to cause problems in animals and/ or humans during pregnancy
  4. Pregnancy causes a number of anatomical and physiological changes
  5. Drugs may cross the placenta or through lactation
- B. Pediatric patients
  1. Based on the child's weight or body surface area
  2. Special concerns for neonates
  3. Length-based resuscitation tape
- C. Geriatric patients

1. The physiological effects of aging can lead to altered pharmacodynamics and pharmacokinetics

XI. The scope of management
- A. Paramedics are held responsible for safe and therapeutically effective drug administration
- B. Paramedics are personally responsible - legally, morally, and ethically - for each drug they administer
- C. Paramedics
  1. Use correct precautions and techniques
  2. Observe and document the effects of drugs
  3. Keep their knowledge base current to changes and trends in pharmacology
  4. Establish and maintain professional relationships
  5. Understand pharmacology
  6. Perform evaluation to identify drug indications and contraindications
  7. Seek drug reference literature
  8. Take a drug history from their patients including:
     - a. Prescribed medications
       - (1) Name
       - (2) Strength
       - (3) Daily dosage
     - b. Over-the-counter medications
     - c. Vitamins
     - d. Drug reactions
  9. Consult with medical direction

XII. Autonomic pharmacology
- A. Nervous system organization and function
  1. Characteristics of nervous system components
     - a. Central nervous system
     - b. Peripheral nervous system
     - c. Somatic system
     - d. Autonomic nervous system (ANS)
     - e. Sympathetic branch of ANS
     - f. Parasympathetic branch of ANS
- B. Peripheral nervous system characteristics
- C. Autonomic nervous system characteristics
  1. Parasympathetic and sympathetic characteristics
  2. Autonomic antagonists
  3. Physiological antagonism between sympathetic and parasympathetic discharge - organ responses
- D. Direction of sympathetic influences
- E. Neurochemical transmission
  1. Events involved in neurochemical transmission
  2. Activities within the synapse
  3. Synthesis of acetylcholine
- F. Other receptors
  1. Catecholamines and related substances
     - a. Dopamine

b. Norepinephrine
c. Epinephrine
d. Serotonin

2. Agonist-gated ion channel receptors and G-protein-linked receptors
3. Neuroactive peptides
   a. Endorphins

G. Effector cell response
1. Second messenger cellular amplification systems
2. Receptor down-regulation
3. Receptor up-regulation

H. Termination of neurotransmission
I. Altering neurotransmission with drugs
1. Modification of chemical transmission by drugs
J. Receptor location and selective drug action
1. Autonomic neurotransmitters
2. Acetylcholine (cholinergic) receptor locations
3. Norepinephrine (adrenergic) receptor locations
K. Selective drug action - nicotinic and muscarinic receptors
1. Nicotinic receptor locations
2. Muscarinic receptor locations
L. Biological model systems and receptor characterization
M. Receptor structure
N. Synaptic control mechanisms

XIII. General properties of drugs
A. Drugs do not confer any new functions on a tissue or organ in the body, they only modify existing functions
B. Drugs in general exert multiple actions rather than a single effect
C. Drug action results from a physiochemical interaction between the drug and a functionally important molecule in the body
D. Drugs that interact with a receptor to stimulate a response are known as agonists
E. Drugs that attach to a receptor but do not stimulate a response are called antagonists
F. Drugs that interact with a receptor to stimulate a response, but inhibit other responses are called partial agonists
G. Once administered, drugs go through four stages
1. Absorption
2. Distribution
3. Metabolism
4. Excretion

XIV. Drug forms
A. Liquid drugs
1. Solutions
2. Tinctures
3. Suspensions
4. Spirits
5. Emulsions
6. Elixirs

7. Syrups

B. Solid drug forms
   1. Pills
   2. Powders
   3. Tablets
   4. Suppositories
   5. Capsules

C. Gas forms

XV. Overview of the routes of drug administration
   A. The mode of drug administration effects the rate at which onset of action occurs and may effect the therapeutic response that results
   B. The choice of the route of administration is crucial in determining the suitability of a drug
   C. Drugs are given for either their local or systemic effects
   D. The routes of drug administration are categorized as

XVI. Routes of medication administration
   A. Inhalation route (nebulized medications)
   B. Enteral (drugs administered along any portion of the gastrointestinal tract)
      a. Sublingual
      b. Buccal
      c. Oral
      d. Rectal
      e. Nasogastric
   C. Parenteral (any medication route other than the alimentary canal)
      a. Subcutaneous
      b. Intramuscular
      c. Intravenous
      d. Intrathecal
      e. Pulmonary
      f. Intralingual
      g. Intradermal
      h. Transdermal
      i. Umbilical
      j. Intraosseous
      k. Nasal
   D. Endotracheal

XVII. Mechanisms of drug action
   A. To produce optimal desired or therapeutic effects, a drug must reach appropriate concentrations at its site of action
   B. Molecules of the chemical compound must proceed from point of entry into the body to the tissues with which they react
   C. The magnitude of the response depends on the dosage and the time course of the drug in the body
   D. Concentration of the drug at its site of action is influenced by various processes, which are divided into three phases of drug activity
      1. Pharmaceutical

a. Disintegration of dosage form
b. Dissolution of drug

2. Pharmacokinetic
   a. Absorption
   b. Distribution
   c. Metabolism
   d. Excretion
3. Pharmacodynamic
   a. Drug-receptor interaction

XVIII. Pharmacokinetics
- A. Passive transport
- B. Active transport
- C. Absorption
  1. Variables that affect drug absorption
     a. Nature of the absorbing surface
     b. Blood flow to the site of administration
     c. Solubility of the drug
     d. pH
     e. Drug concentration
     f. Dosage form
     g. Routes of drug administration
     h. Bioavailability
  2. Mechanisms involved in absorption
     a. Diffusion
     b. Osmosis
     c. Filtration
- D. Distribution
  1. Drug reservoirs
     a. Plasma protein binding
     b. Tissue binding
  2. Barriers to drug distribution
     a. Blood-brain barrier
     b. Placental barrier
- E. Biotransformation
  1. Active metabolites
  2. Inactive metabolites
- F. Excretion
  1. Organs of excretion
     a. Kidneys
     b. Intestine
     c. Lungs
     d. Sweat and salivary glands
     e. Mammary glands

XIX. Pharmacodynamics
- A. Theories of drug action - most drugs produce their effects by one of the following ways
  1. Drug-receptor interaction

a. Agonists
b. Antagonists
c. Affinity
d. Efficacy
e. Types of receptors
(1) $Beta_1$
(2) $Beta_2$
(3) $Alpha_1$
(4) $Alpha_2$
(5) Dopaminergic
(6) Others

2. Drug-enzyme interaction
3. Nonspecific drug interaction

B. Drug-response relationship
1. Plasma level profile of a drug
2. Biologic half-life
3. Therapeutic threshold or minimum effective concentration
4. Therapeutic index

C. Factors altering drug responses
1. Age
2. Body mass
3. Sex
4. Environmental milieu
5. Time of administration
6. Pathologic state
7. Genetic factors
8. Psychologic factors

D. Predictable responses
1. Desired action
2. Side effects

E. Iatrogenic responses (adverse effects produced unintentionally)

F. Unpredictable adverse responses
1. Drug allergy (medications frequently implicated in allergic reactions)
2. Anaphylactic reaction
3. Delayed reaction ("serum sickness")
4. Hypersensitivity
5. Idiosyncracy
6. Tolerance
7. Cross tolerance
8. Tachyphylaxis
9. Cumulative effect
10. Drug dependence
11. Drug interaction
12. Drug antagonism
13. Summation (addition or additive effect)
14. Synergism
15. Potentiation
16. Interference

XX. Drug interactions
- A. Variables influencing drug interaction include
  1. Intestinal absorption
  2. Competition for plasma protein binding
  3. Drug metabolism or biotransformation
  4. Action at the receptor site
  5. Renal excretion
  6. Alteration of electrolyte balance
- B. Drug-drug interactions
- C. Other drug interactions
  1. Drug-induced malabsorption of foods and nutrients
  2. Food-induced malabsorption of drugs
  3. Alteration of enzymes
  4. Alcohol consumption
  5. Cigarette smoking
  6. Food-initiated alteration of drug excretion
- D. Drug incompatibilities - occur when drugs are mixed before administration

XXI. Drug storage
- A. Certain precepts should guide the manner in which drugs are secured, stored, distributed, and accounted for
- B. Refer to local protocol
- C. Drug potency can be affected by
  1. Temperature
  2. Light
  3. Moisture
  4. Shelf life
- D. Applies also to diluents
- E. Security of controlled medications
  1. Procedures and other measures to ensure the security of controlled medications

XXII. Components of a drug profile
- A. Drug names
- B. Classification
- C. Mechanisms of action
- D. Indications
- E. Pharmacokinetics
- F. Side/ adverse effects
- G. Routes of administration
- H. How supplied
- I. Dosages
- J. Contraindications
- K. Considerations for pediatric patients, geriatric patients, pregnant patients, and other special patient groups
- L. Other profile components

XXIII. Drugs by classifications

A. Analgesics and antagonists
   1. Nonprescription analgesic-antipyretics
   2. Opioid analgesics-agonists
   3. Adjuvant medications
   4. Opioid antagonists
   5. Opioid agonist-antagonist agents

B. Anesthetics
   1. Anesthesia
   2. Significant drug interactions
   3. Special anesthesia considerations
   4. Types of anesthetics
      a. Inhalation anesthetics
      b. Intravenous anesthetics
      c. Ultra-short-acting barbiturates
      d. Dissociative anesthetic
      e. Neuroleptanesthesia
   5. Local anesthesia
      a. Surface or topical anesthesia
   6. Anesthesia by injection

C. Antianxiety, sedative, and hypnotic drugs
   1. Physiology of sleep
   2. Benzodiazepines
   3. Benzodiazepine antidote
   4. Barbiturates
   5. Miscellaneous sedatives and hypnotics
      a. Antianxiety agents/ sedatives
      b. Hypnotics

D. Anticonvulsants
   1. Anticonvulsant therapy
   2. Hydantoins
   3. Barbiturates
   4. Succinimides
   5. Diones
   6. Benzodiazepines
   7. Other Anticonvulsants

E. Central nervous system stimulants
   1. Anorexiant drugs
   2. Amphetamines
   3. Other central nervous system stimulants

F. Psychotherapeutic drugs
   1. The central nervous system and emotions
   2. The role of drug therapy in psychiatry
   3. Antipsychotic or neuroleptic agents
      a. Phenothiazine derivatives
      b. Butyrophenone derivatives
      c. Dihydroindolone derivatives
      d. Dibenzoxapine derivatives
   4. Antidepressant therapy

a. Monoamines
b. Tricyclic antidepressants
c. Monoamine oxidase inhibitor antidepressants
d. Antimanic drugs

G. Drugs for specific CNS-peripheral dysfunctions
1. Parkinson's disease
2. Drugs with central anticholinergic activity
a. Anticholinergic agents
b. Drugs affecting brain dopamine
(1) Drugs that increase brain levels of dopamine
(2) Dopamine-releasing drug
(3) Dopaminergic agonists
c. Monoamine oxidase inhibitor

H. Drugs affecting the parasympathetic nervous system
1. Cholinergic drugs
a. Direct-acting cholinergic drugs (choline esters)
b. Indirect-acting cholinergic drugs
c. Drugs used to treat myasthenia gravis
2. Cholinergic blocking drugs
a. Muscarinic blocking drugs
b. Belladonna alkaloids
c. Synthetic substitutes for atropine
3. Ganglionic stimulating drugs
a. Nicotine
4. Ganglionic blocking drugs

I. Drugs affecting the sympathetic (adrenergic) nervous system
1. Adrenergic drugs
a. Direct-acting adrenergic drugs
(1) Catecholamines
b. Drugs used for hypoperfusion
c. Indirect- and dual-acting adrenergic drugs
2. Adrenergic blocking drugs
a. Alpha-adrenergic blocking drugs
b. Noncompetitive, long-acting antagonists
c. Competitive, short-acting antagonists
d. Beta-adrenergic blocking agents

J. Skeletal muscle relaxants
1. Central-acting skeletal muscle relaxants
2. Direct-acting skeletal muscle relaxants

K. Drugs affecting the cardiovascular system
1. Antidysrhythmics
a. Group I-A Drugs
b. Group I-B Drugs
c. Group I-C Drugs
d. Group I Drugs (A, B, C)
e. Group II Drugs
f. Group III Drugs
g. Group IV Drugs (miscellaneous drug group)

2. Antihypertensives
    a. Diuretic drugs
        (1) Thiazides
        (2) Loop diuretics
        (3) Potassium-sparing agents
    b. Adrenergic inhibiting (sympatholytic) agents
        (1) Beta-adrenergic blocking agents
        (2) Centrally-acting adrenergic inhibitors
        (3) Peripheral adrenergic inhibitors
        (4) Rauwolfia derivatives
        (5) Alpha-adrenergic blocking drugs
    c. Angiotensin-converting enzyme inhibitors
    d. Calcium channel blocking agents
    e. Vasodilators
        (1) Arteriolar dilator drugs
        (2) Arterial and venous dilator drugs
    f. Ganglionic blocking drugs
    g. Monoamine oxidase inhibiting drugs
3. Cardiac glycosides
    a. Digitalis glycosides
    b. Miscellaneous agents
4. Calcium channel blockers
5. Vasodilators
    a. Antianginal drugs
    b. Nitrates
    c. Drugs for peripheral occlusive arterial disease
    d. Other vasodilating agents
6. Antihemorrheologic agents

L. Anticoagulants, thrombolytics, and blood components
1. Anticoagulant drugs
    a. Parenteral anticoagulant drugs
    b. Parenteral anticoagulant antagonists
    c. Oral anticoagulant therapy
    d. Oral anticoagulant antagonist - vitamin K
2. Thrombolytic therapy
3. Antihemophilic agents
4. Hemostatic agents
5. Blood and blood components
    a. Replacement therapies

M. Antihyperlipidemic drugs
N. Diuretics
1. Proximal tubule diuretics
2. Diluting segment diuretics (thiazide and thiazide-type drugs)
3. Loop diuretics
4. Distal tube diuretics/ potassium-sparing diuretics
5. Osmotic diuretics
6. Diuretic combinations

O. Drug therapy for renal system dysfunction

P. Mucokinetic and bronchodilator drugs
  1. Mucokinetic drugs
    a. Diluents
    b. Aerosol therapy
    c. Mucolytic drugs
    d. Drugs that antagonize bronchial secretions
  2. Bronchodilator drugs
    a. Sympathomimetic drugs
      (1) Nonselective adrenergic drugs
      (2) Nonselective beta-adrenergic drugs
      (3) Selective $beta_2$ receptor drugs
      (4) Catecholamine $beta_2$ receptor agents
      (5) Noncatecholamine $beta_2$ receptor drugs
  3. Xanthine derivatives
  4. Prophylactic asthmatic drugs
    a. Inhalation corticosteroid therapy

Q. Oxygen and miscellaneous respiratory agents
  1. Drugs that affect the respiratory center
    a. Oxygen therapy
    b. Direct respiratory stimulants
    c. Reflex respiratory stimulants
    d. Respiratory depressants
  2. Cough suppressants
    a. Opioid antitussive drugs
    b. Nonopioid antitussive drugs
  3. Nasal decongestants
  4. Antihistamines
  5. Serotonin
  6. Antiserotonin

R. Drugs affecting the gastrointestinal system
  1. Drugs that affect the stomach
    a. Antacid combinations
    b. Antiflatulents
    c. Digestants
    d. Antiemetics
    e. Cannabinoids
    f. Emetic agents
    g. Cytoprotective agents
    h. H_2 receptor antagonists
  2. Drugs affecting the lower gastrointestinal tract
    a. Laxatives
    b. Antidiarrheals

S. Ophthalmic drugs
  1. Antiglaucoma agents
  2. Mydriatic and cycloplegic agents
  3. Antiinfective/ antiinflammatory agents
  4. Topical anesthetic agents
  5. Other ophthalmic preparations

T. Drugs affecting the ear
   1. Antibiotic ear preparations
   2. Steroid and antibiotic combinations
   3. Miscellaneous preparations

U. Drugs affecting the pituitary
   1. Anterior pituitary hormones
   2. Posterior pituitary hormones

V. Drugs affecting the parathyroid and thyroid
   1. Thyroid preparations
   2. Antithyroid agents
   3. Iodine products
   4. Thiomide derivatives

W. Drugs affecting the adrenal cortex
   1. Glucocorticoids
   2. Mineralocorticoids
   3. Antiadrenals (adrenal steroid inhibitors)

X. Drugs affecting the pancreas
   1. Insulin preparations
   2. Oral hypoglycemic agents
   3. Hyperglycemic agents

Y. Drugs affecting the female reproductive system
   1. Female sex hormones
      a. Estrogens
      b. Progesterone and progestins
   2. Oral contraceptives
   3. Ovulatory stimulants and drugs used for infertility

Z. Drugs for labor and delivery
   1. Drugs affecting the uterus
      a. Oxytocics
      b. Premature labor inhibitors

AA. Drugs affecting the male reproductive system
   1. Testosterone

BB. Drugs affecting sexual behavior
   1. Drugs used to impair libido and sexual gratification
   2. Drugs used to enhance libido and sexual gratification

CC. Antineoplastic agents

DD. Drugs used in infectious disease and inflammation

EE. Antibiotics
   1. Penicillins
   2. Cephalosporins and related products
   3. Macrolide antibiotics
   4. Tetracyclines
   5. Miscellaneous antibiotics

FF. Antifungal and antiviral drugs
   1. Antifungal drugs
   2. Antiviral drugs

GG. Other antimicrobial drugs and antiparasitic drugs
   1. Antimalarial medications

2. Antituberculous agents
3. Antiamebiasis agents
4. Anthelmintic agents
5. Leprostatic agents

HH. Nonsteroidal antiinflammatory drugs
II. Uricosuric drugs
JJ. Serums, vaccines, and other immunizing agents
KK. Drugs affecting the immunologic system
1. Immunosuppressants
2. Immunomodulating agents
LL. Dermatologic drugs
1. General dermatologic preparations
2. Prophylactic agents
MM. Vitamins and minerals
1. Vitamins
a. Fat-soluble vitamins
b. Water-soluble vitamins
2. Minerals
NN. Fluids and electrolytes
1. Parenteral solutions
2. Electrolytes
OO. Antidotes/ overdoses
1. Specific to the type of poison
a. Elimination