

HOW TO USE Clinical Drug Therapy

Drugs at a Glance tables give students characteristics as well as routes and dosage ranges in an easy-to-read format. Prototype drugs are highlighted in the tables and in the text.

Table 6-1 Drugs at a Glance: Opioid Analgesics

GENERIC/TRADE NAME	ROUTES AND DOSAGE RANGES	
	Adults	Children
Agonists Codeine	<i>Pain:</i> PO, Sub-Q, IM 15–60 mg q4–6h PRN; usual dose 30 mg; maximum, 360 mg/24 h <i>Cough:</i> PO 10–20 mg q4h PRN; maximum, 120 mg/24 h	<i>1 y or older, Pain:</i> PO, Sub-Q, IM 0.5 mg/kg q4–6h PRN <i>2–6 y, Cough:</i> PO 2.5–5 mg q4–6h; maximum, 30 mg/24 h <i>6–12 y, Cough:</i> PO 5–10 mg q4–6h; maximum, 60 mg/24 h
Fentanyl (Sublimaze)	Preanesthetic sedation, IM 0.05–0.1 mg 30–60 min before surgery Analgesic adjunct to general anesthesia, IV total dose of 0.002–0.05 mg/kg, depending on the surgical procedure Adjunct to regional anesthesia, IM or slow IV (over 1–2 min) 0.05–0.1 mg PRN Postoperative analgesia, IM 0.05–0.1 mg, repeat in 1–2 h if needed General anesthesia, IV 0.05–0.1 mg/kg with oxygen and a muscle relaxant (maximum dose 0.15 mg/kg with open-heart surgery, other major surgeries, and complicated neurologic or orthopedic procedures) Chronic pain, transdermal system 2.5–10 mg every 72 h	<i>Weight at least 10 kg:</i> Conscious sedation or preanesthetic sedation, 5–15 mcg/kg of body weight (100–400 mcg), depending on weight, type of procedure, and other factors. Maximum dose, 400 mcg, regardless of age and weight. <i>2–12 y:</i> General anesthesia induction and maintenance, IV 2–3 mcg/kg

OBJECTIVES

After studying this chapter, you will be able to:

1. Identify types and potential causes of seizures.
2. Discuss major factors that influence choice of an antiseizure drug for a client with a seizure disorder.
3. Give characteristics and effects of commonly used antiseizure drugs.
4. Differentiate between older and more recent antiseizure drugs.
5. Compare advantages and disadvantages between monotherapy and combination drug therapy for seizure disorders.
6. Apply the nursing process with clients receiving antiseizure drugs.
7. Describe strategies for prevention and treatment of status epilepticus.
8. Discuss the use of antiseizure drugs in special populations.

Chapter Objectives let students know what they're going to learn in each and every chapter.



APPLYING YOUR KNOWLEDGE 10-1: HOW CAN YOU AVOID THIS MEDICATION ERROR?

Mr. Mehring is talking with his pastor when you arrive to administer his medication. He asks you to just leave the medication and he will take it when he finishes his visit. You leave the medication with Mr. Mehring and chart it as given.

APPLYING YOUR KNOWLEDGE

While in the hospital, Carl Mehring, age 70, is diagnosed with chronic depression secondary to his chronic heart failure, hypertension, diabetes mellitus, and renal insufficiency. As Mr. Mehring's health has declined, so has his interest in his family, friends, and hobbies. His physician prescribes sertraline 50 mg PO twice a day.

APPLYING YOUR KNOWLEDGE: ANSWERS

- 10-1** The nurse should never leave an antidepressant at the bedside. Charting the medication as given when it has not yet been taken by the client is not truthful, and the client may forget to take the medication or may hold the medication for a later time and save up multiple doses. This is especially problematic with a client suffering from depression because he or she may have suicidal ideations.
- 10-2** Some antidepressant medications, such as sertraline, are in the class of selective serotonin reuptake inhibitors (SSRIs), which may not reach a therapeutic effect for up to 2 to 4 weeks. Provide appropriate teaching for both the client and his wife regarding therapeutic effect. Check to make sure that Mr. Mehring is taking the right dosage. Encourage him to continue taking the medication.
- 10-3** Check with the physician to see if Mr. Mehring's dose can be taken once a day in the morning. If this is not possible, then check to see if a different SSRI can be given that has once-a-day dosing. Taking the dose in the morning may solve Mr. Mehring's sleeping difficulty if the problem is due to the drug and not due to the depression.

Applying Your Knowledge features help students apply concepts to client care. Most chapters open with a client scenario, which is then carried through the chapter. Applying Your Knowledge questions require students to take the content they have learned and apply it to the client in the case study, and special "How Do You Avoid This Medication Error?" questions reinforce safe drug administration. Answers are provided at the end of each chapter, allowing students to monitor their progress.

Nursing Process material helps students think about drug therapy in terms of the nursing process.

400 mg three times a day) and deciding for themselves whether their symptoms improve (eg, less pain, improved ability to walk) and whether they want to continue.

NURSING PROCESS

Assessment

- Assess for signs and symptoms of pain, such as location, severity, duration, and factors that cause or relieve the pain (see Chap. 6).
- Assess for fever (thermometer readings above 99.6°F [37.3°C] are usually considered fever). Hot, dry skin; flushed face; reduced urine output; and concentrated urine may accompany fever if the person also is dehydrated.
- Assess for inflammation. Local signs are redness, heat, edema, and pain or tenderness; systemic signs include fever, elevated white blood cell count (leukocytosis), and weakness.
- With arthritis or other musculoskeletal disorders, assess for pain and limitations in activity and mobility.
- Ask about use of OTC analgesic, antipyretic, or anti-inflammatory drugs and herbal or dietary supplements.
- Ask about allergic reactions to aspirin or NSAIDs.
- Assess for history of peptic ulcer disease, GI bleeding, or kidney disorders.
- With migraine, assess severity and patterns of occurrences.

Nursing Diagnoses

- Acute Pain
- Chronic Pain
- Activity Intolerance related to pain
- Risk for Poisoning: Acetaminophen overdose
- Risk for Injury related to adverse drug effects (GI bleeding, renal insufficiency)
- Deficient Knowledge: Therapeutic and adverse effects of commonly used drugs
- Deficient Knowledge: Correct use of OTC drugs for pain, fever, and inflammation

Planning/Goals

The client will

- Experience relief of discomfort with minimal adverse drug effects
- Experience increased mobility and activity tolerance
- Inform health care providers if taking aspirin, an NSAID or acetaminophen regularly.
- Self-administer the drugs safely
- Avoid overuse of the drugs
- Use measures to prevent accidental ingestion or overdose, especially in children
- Experience fewer and less severe attacks of migraine

Interventions

Implement measures to prevent or minimize pain, fever, and inflammation.

- Treat the disease processes (eg, infection, arthritis) or circumstances (eg, impaired blood supply, lack of physical activity, poor positioning or body alignment) thought to be causing pain, fever, or inflammation.
- Treat pain as soon as possible; early treatment may prevent severe pain and anxiety and allow the use of milder analgesic drugs. Use distraction, relaxation techniques, or other nonpharmacologic techniques along with drug therapy, when appropriate.
- With acute musculoskeletal injuries (eg, sprains), cold applications can decrease pain, swelling, and inflammation. Apply for approximately 20 minutes, then remove.
- Assist clients with migraine to identify and avoid “triggers.” Assist clients to drink 2 to 3 liters of fluid daily when taking an NSAID regularly. This strategy decreases gastric irritation and helps to maintain good kidney function. With long-term use of aspirin, fluids help to prevent precipitation of salicylate crystals in the urinary tract. With antigout drugs, fluids help to prevent precipitation of urate crystals and formation of urate kidney stones. Fluid intake is especially important initially when serum uric acid levels are high and large amounts of uric acid are being excreted.

Provide appropriate teaching for any drug therapy (see accompanying displays).

Evaluation

- Interview and observe regarding relief of symptoms.
- Interview and observe regarding mobility and activity levels.
- Interview and observe regarding safe, effective use of the drugs.
- Select drugs appropriately.

APPLYING YOUR KNOWLEDGE 7-3

Given Julie’s medication regimen, what nursing measures should be implemented to decrease the probability of GI bleeding?

PRINCIPLES OF THERAPY

Use of Aspirin

When pain, fever, or inflammation is present, aspirin is effective across a wide range of clinical conditions. Like any other drug, aspirin must be used appropriately to maximize therapeutic benefits and minimize adverse reactions.

CLIENT TEACHING GUIDELINES

Antianxiety and Sedative-Hypnotic Drugs

General Considerations

- “Nerve pills” and “sleeping pills” can relieve symptoms temporarily, but they do not cure or solve the underlying problems. With rare exceptions, these drugs are recommended only for short-term use. For long-term relief, counseling or psychotherapy may be more beneficial because it can help you learn other ways to decrease your nervousness and difficulty in sleeping.
- Use nondrug measures to promote relaxation, rest, and sleep when possible. Physical exercise, reading, craft work, stress management, and relaxation techniques are safer than any drug.
- Try to identify and avoid factors that cause nervousness or insomnia, such as caffeine-containing beverages and stimulant drugs. This may prevent or decrease the severity of nervousness or insomnia so that sedative-type drugs are not needed. If the drugs are used, these factors can cancel or decrease the drugs’ effects. Stimulant drugs include asthma and cold remedies and appetite suppressants.
- Most “nerve pills” and “sleeping pills” belong to the same chemical group and have similar effects, including the ability to decrease nervousness, cause drowsiness, and cause dependence. Thus, there is no logical reason to take a combination of the drugs for anxiety, or to take one drug for daytime sedation and another for sleep. Ativan, Xanax, Valium, and Restoril are commonly used examples of this group, but there are several others as well.
- Inform all health care providers when taking a sedative-type medication, preferably by the generic and trade names. This helps avoid multiple prescriptions of drugs with similar effects and reduces the risk of serious adverse effects from overdose.
- Do not perform tasks that require alertness if drowsy from medication. The drugs often impair mental and physical functioning, especially during the first several days of use, and thereby

they produce additive depression and may lead to excessive drowsiness, difficulty breathing, traumatic injuries, and other potentially serious adverse drug effects.

- Store drugs safely, out of reach of children and adults who are confused or less than alert. Accidental or intentional ingestion may lead to serious adverse effects. Also, do not keep the drug container at the bedside, because a person sedated by a previous dose may take additional doses.
- Do not share these drugs with anyone else. These mind-altering, brain-depressant drugs should be taken only by those people for whom they are prescribed.
- Do not stop taking a Valium-related drug abruptly. Withdrawal symptoms can occur. When being discontinued, dosage should be gradually reduced, as directed by and with the supervision of a health care provider.
- Do not take “sleeping pills” every night. These drugs lose their effectiveness in 2–4 weeks if taken nightly, and cause sleep disturbances when stopped.
- Alprazolam (Xanax) is sometimes confused with ranitidine (Zantac), a drug for heartburn and peptic ulcers.

Self-Administration

- Follow instructions carefully about how much, how often, and how long to take the drugs. These drugs produce more beneficial effects and fewer adverse reactions when used in the smallest effective doses and for the shortest duration feasible in particular circumstances. All of the Valium-related drugs, zaleplon (Sonata), and zolpidem (Ambien) can cause physical dependence, which may eventually cause worse problems than the original anxiety or insomnia.
- Take sleeping pills just before going to bed so that you are lying down when the expected drowsiness occurs.

Client Teaching Guidelines give students specific information they may need to educate patients.

HOW TO USE Clinical Drug Therapy (continued)

Herbal and Dietary Supplement content is highlighted so students become aware of how these alternative therapies can affect traditional medications.



Herbal Supplement

St. John's wort (*Hypericum perforatum*) is an herb that is widely self-prescribed for depression. Several studies, most of which used about 900 milligrams daily of a standardized extract, indicate its usefulness in mild to moderate depression, with fewer adverse effects than antidepressant drugs. A 3-year, multicenter study by the National Institutes of Health concluded that the herb is not effective in major depression.

Antidepressant effects are attributed mainly to hypericin, although several other active components have also been identified. The mechanism of action is unknown, but the herb is thought to act similarly to antidepressant drugs. Some herbalists refer to St. John's wort as "natural Prozac."

Adverse effects, which are usually infrequent and mild, include constipation, dizziness, dry mouth, fatigue, GI distress, nausea, photosensitivity, restlessness, skin rash, and sleep disturbances. These symptoms are relieved by stopping the herb.

Drug interactions may be extensive. St. John's wort should not be combined with alcohol, antidepressant drugs (eg, MAO inhibitors, SSRIs, TCAs), nasal decongestants or other over-the-counter cold and flu medications, bronchodilators, opioid analgesics, or amino acid supplements containing phenylalanine and tyrosine. All of these interactions may result in hypertension, possibly severe.

NURSING ACTIONS

Antiseizure Drugs

NURSING ACTIONS

RATIONALE/EXPLANATION

1. Administer accurately

- a. Give on a regular schedule about the same time each day.
- b. Give most oral antiseizure drugs after meals or with a full glass of water or other fluid; levetiracetam, oxcarbazepine, topiramate, and zonisamide may be taken with or without food.

To maintain therapeutic blood levels of drugs

Most antiseizure drugs cause some gastric irritation, nausea, or vomiting. Taking the drugs with food or fluid helps decrease gastrointestinal side effects.

c. To give phenytoin:

- (1) Shake oral suspensions of the drug vigorously before pouring and always use the same measuring equipment.

In suspensions, particles of drug are suspended in water or other liquid. On standing, drug particles settle to the bottom of the container. Shaking the container is necessary to distribute drug particles in the liquid vehicle. If the contents are not mixed well every time a dose is given, the liquid vehicle will be given initially, and the concentrated drug will be given later. That is, underdosage will occur at first, and little if any therapeutic benefit will result. Overdosage will follow, and the risks of serious toxicity are greatly increased. Using the same measuring container ensures consistent dosage. Calibrated medication cups or measuring teaspoons or tablespoons are acceptable. Regular household teaspoons and tablespoons used for eating and serving are not acceptable because sizes vary widely.

- (2) Do not mix parenteral phenytoin in the same syringe with any other drug.

Phenytoin solution is highly alkaline (pH approximately 12) and physically incompatible with other drugs. A precipitate occurs if mixing is attempted.

- (3) Give phenytoin as an undiluted intravenous (IV) bolus injection at a rate not exceeding 50 mg/min, then flush the IV line with normal saline or dilute in 50–100 mL of normal saline (0.9% NaCl) and administer over approximately 30–60 minutes. If piggybacked into a primary IV line, the primary IV solution must be normal saline or the line must be flushed with normal saline before and after administration of phenytoin. An in-line filter is recommended.

Phenytoin cannot be diluted or given in IV fluids other than normal saline because it precipitates within minutes. Slow administration and dilution decrease local venous irritation from the highly alkaline drug solution. Rapid administration must be avoided because it may produce myocardial depression, hypotension, cardiac dysrhythmias, and even cardiac arrest.

d. To give IV fosphenytoin:

- (1) Check the physician's order and the drug concentration carefully.
- (2) Dilute the dose in 5% dextrose or 0.9% sodium chloride solution to a concentration of 1.5 mg PE/mL to 25 mg PE/mL and infuse no faster than 150 mg PE/min.

The dose is expressed in phenytoin equivalents (PE; fosphenytoin 50 mg PE = phenytoin 50 mg).

The drug is preferably diluted in the pharmacy and labeled with the concentration and duration of the infusion. For a 100-mg PE dose, diluting with 4 mL yields the maximum concentration of 25 mg PE/mL; this amount could be infused in about 1 min at the maximal recommended rate. A 1-g loading dose could be added to 50 mL of 0.9% sodium chloride and infused in approximately 10 min at the maximal recommended rate.

- (3) Consult a pharmacist or the manufacturer's literature if any aspect of the dose or instructions for administration are unclear.

To avoid error

- e. To give carbamazepine and phenytoin suspensions by nasogastric (NG) feeding tube, dilute with an equal amount of

Absorption is slow and decreased, possibly because of drug adherence to the NG tube. Dilution and tube irrigation decrease such adherence.

Nursing Actions give students specific instructions on administration of drugs and observations of client responses, with rationales for each step.

Review and Application Exercises provide students with the opportunity to review what they just learned. These include both short-answer exercises and NCLEX-style questions.

APPLYING YOUR KNOWLEDGE: ANSWERS

- 11-1** Monitor the phenytoin level. The normal free phenytoin level is 0.8 to 2 mcg/mL. Adequate serum levels are needed for seizure control.
- 11-2** Ask if Frank is taking a monoamine oxidase (MAO) inhibitor, which may be used to treat depression. Carbamazepine should not be taken within 14 days of an MAO inhibitor.
- 11-3** The client must always taper the dosage of an AED gradually, or the seizures may exacerbate.

Review and Application Exercises

Short Answer Exercises

1. For a client with a newly developed seizure disorder, why is it important to verify the type of seizure by electroencephalogram before starting AEDs?
2. What are the indications for use of the major AEDs?
3. What are the major adverse effects of commonly used AEDs, and how can they be minimized?
4. What are the advantages and disadvantages of treatment with a single drug and of treatment with multiple drugs?
5. Which of the benzodiazepines are used as AEDs?
6. What are the advantages of carbamazepine and valproic acid compared with the benzodiazepines, phenytoin, and phenobarbital?
7. How are the newer drugs similar to or different from phenytoin?
8. What is the treatment of choice for an acute convulsion or status epilepticus?
9. Why is it important when teaching clients to emphasize that none of the AEDs should be stopped abruptly?
10. How can a home care nurse monitor AED therapy during a home visit?

NCLEX-Style Questions

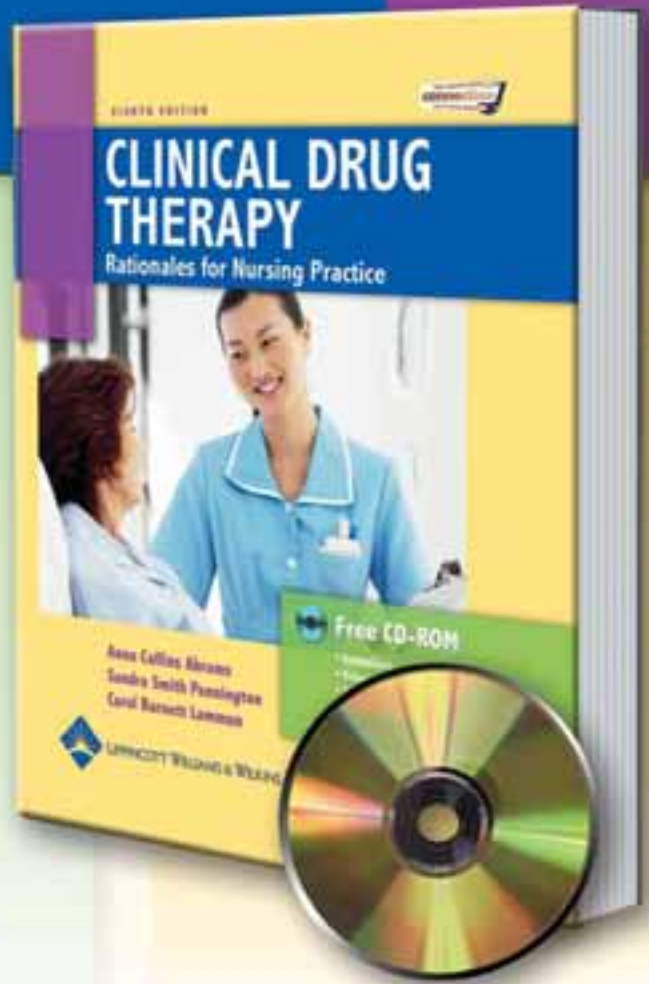
- 11.** An 18-year-old client presents to the clinic with complaints of breast tenderness, nausea, vomiting, and absence of menses for 2 months. She has a history of a seizure disorder that is well controlled with oxcarbazepine (Trileptal). She believes that she has been taking her oral contraceptives as directed but asks if she could be pregnant. The nurse recognizes that the best response to the client's question is which of the following?
- a. "Oxcarbazepine can decrease the effectiveness of oral contraceptive drugs, so we need to do a pregnancy test."
 - b. "You can't be pregnant if you have been taking your pills correctly."
 - c. "Don't worry; birth control pills are very effective."
 - d. "Taking antiseizure drugs with oral contraceptives significantly decreases your risk of pregnancy."
- 12.** A client scheduled for her next dose of phenytoin (Dilantin) has a serum plasma phenytoin level of 16 mcg/mL. Based on this information, the nurse should do which of the following?
- a. Administer the drug.

Student Resources for Abrams' Clinical Drug Therapy, Eighth Edition

These reliable resources accompany the text and provide additional tools to help you succeed!

A FREE CD-ROM in the back of the book includes:

- A **Medication Administration video**.
- **NCLEX-style review questions** with rationales.
- **Drug Monographs** for the top 100 most commonly prescribed drugs!.
- **Animations** help you understand concepts including:
 - Absorption
 - Nerve Synapse
 - Distribution
 - Muscle Contraction
 - Drug Binding
 - Immune Response
 - Excretion
 - Cell Cycle
 - Hypertension
 - Intramuscular Injection
 - Intravenous Injection
 - Gas Exchange in Alveoli
 - Heart Failure
 - Stroke
 - Hemostasis



Plus, A FREE Photo Atlas of Medication Administration, shrink-wrapped with the book, illustrates techniques for safe drug administration. Rationales to help you understand every nursing action are included.

 Lippincott
Williams & Wilkins
a Wolters Kluwer business

Quick Reference to Features

Client Teaching Guidelines

Safe and Effective Use of Prescription Medications 55
Safe and Effective Use of Over-the-Counter (OTC) Medications 57
General Information About Herbal and Dietary Supplements 61
Opioid (Narcotic) Analgesics 93
Acetaminophen, Aspirin, and Other NSAIDs 120
Drugs Used in Migraines 121
Antianxiety and Sedative-Hypnotic Drugs 143
Antipsychotic Drugs 163
Antidepressants and Lithium 183
Antiseizure Medications 204
Antiparkinson Drugs 220
Skeletal Muscle Relaxants 231
Methylphenidate and Dexamethylphenidate 258
Adrenergic Drugs 280
Alpha₂ Agonists and Alpha-Blocking Drugs 298
Beta-Blocking Drugs 299
Cholinergic Drugs 313
Anticholinergic Drugs 326
Growth Hormone 347
Fertility Drugs 347
Long-Term Corticosteroid Therapy 362
Levothyroxine 379
Propylthiouracil or Methimazole 380
Drugs for Osteoporosis 396
Antidiabetic Drugs 420
Hormone Replacement Therapy 447
Oral Contraceptives 448
Androgens 460
Antimicrobial Drugs 477
Oral Penicillins 495
Oral Cephalosporins 496
Oral Fluoroquinolones 509
Oral Tetracyclines 522
Oral Sulfonamides 523
Macrolides and Ketolides 534
Isoniazid, Rifampin, and Pyrazinamide 552
Miscellaneous Antiviral Drugs 572
Antiretroviral Drugs 573
Oral and Topical Antifungal Drugs 594
Antiparasitic Drugs 614
Vaccinations 644
Blood Cell and Immune System Stimulants 658
Immunosuppressant Drugs 677
Managing Chemotherapy 710
Antiasthmatic Drugs 740
Antihistamines 756
Nasal Decongestants, Anticough Medications, and Multi-Ingredient Cold Remedies 766

Digoxin 786
Antidysrhythmic Drugs 807
Antianginal Drugs 824
Antihypertensive Drugs 852
Diuretics 869
Drugs to Prevent or Treat Blood Clots 889
Dyslipidemic Drugs 905
Nutritional Support Products, Vitamins, and Minerals 935
Weight Management and Drugs That Aid Weight Loss 961
Antiulcer and Anti-Heartburn Drugs 979
Laxatives 992
Antidiarrheals 1005
Antiemetic Drugs 1016
Topical Eye Medications 1032
Topical Medications for Skin Disorders 1050
Drug Use During Pregnancy and Lactation 1074

Nursing Actions

Drug Administration 44
Monitoring Drug Therapy 70
Opioid Analgesics 99
Analgesic–Antipyretic–Anti-Inflammatory, and Related Drugs 126
Antianxiety and Sedative-Hypnotic Drugs 149
Antipsychotic Drugs 168
Antidepressants 188
Antiseizure Drugs 209
Antiparkinson Drugs 222
Skeletal Muscle Relaxants 232
Central Nervous System Stimulants 260
Adrenergic Drugs 284
Antiadrenergic Drugs 302
Cholinergic Drugs 315
Anticholinergic Drugs 329
Hypothalamic and Pituitary Hormones 348
Corticosteroids 369
Thyroid and Antithyroid Drugs 383
Drugs Used in Calcium and Bone Disorders 400
Antidiabetic Drugs 428
Estrogens, Progestins, and Hormonal Contraceptives 451
Androgens and Anabolic Steroids 461
Antimicrobial Drugs 481
Beta-Lactam Antibacterials 499
Aminoglycosides and Fluoroquinolones 512
Tetracyclines, Sulfonamides, and Urinary Agents 524

Macrolides, Ketolides, and Miscellaneous Antibacterials 536
Antitubercular Drugs 556
Antiviral Drugs 576
Antifungal Drugs 598
Antiparasitics 615
Immunizing Agents 647
Hematopoietic and Immunostimulant Agents 661
Immunosuppressants 684
Antineoplastic Drugs 715
Drugs for Asthma and Other Bronchoconstrictive Disorders 744
Antihistamines 758
Nasal Decongestants, Antitussives, and Cold Remedies 768
Cardiotonic-Inotropic Drugs 789
Antidysrhythmic Drugs 810
Antianginal Drugs 826
Drugs Used in Hypotension and Shock 835
Antihypertensive Drugs 858
Diuretics 872
Drugs That Affect Blood Coagulation 892
Drugs for Dyslipidemia 907
Nutritional Products, Vitamins, and Mineral–Electrolytes 945
Drugs for Weight Loss and Maintenance 967
Antiulcer Drugs 983
Laxatives and Cathartics 994
Antidiarrheals 1006
Antiemetics 1018
Ophthalmic Drugs 1034
Dermatologic Drugs 1054
Abortifacients, Prostaglandins, Tocolytics, and Oxytocics 1075

Research Briefs

Patient-Controlled Analgesia Using a Skin Patch 95
Rebound Headaches Associated With Overuse of Analgesics 130
Rasagiline (Agilect), A New Antiparkinson Drug 221
Smoking Cessation 249
Epinephrine vs. Vasopressin: A Look at Selected Current Research 281
Use of Cardioselective Beta Blockers in Clients With Chronic Obstructive Pulmonary Disease 296
Use of Alternative Medicines in Diabetes Mellitus 416
Adjuvant Chemotherapy in Treatment of Breast Cancer 713
Use of Digoxin in Men and Women 783
Effects of Vitamin E Supplementation 939
Commercial Weight-Loss Programs 965