Foreign Pharmacy Graduate Equivalency Examination® (FPGEE®)

Study Guide

FPGEE Study Guide

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FPGEE reg. no. 2,337,295

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1/07

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FPGEE Blueprint

FPGEE Administration

The Foreign Pharmacy Graduate Equivalency Examination® (FPGEE®) is based on a nationally uniform content blueprint. The following blueprint, revised in 2007, provides important information about the topics covered on the examination and the knowledge you are expected to demonstrate while taking the FPGEE.

The examination is a comprehensive measure of knowledge in four major pharmacy content areas:

21% – Basic Biomedical Sciences
29% – Pharmaceutical Sciences
15% – Social/Behavioral/Administrative Pharmacy Sciences
35% – Clinical Sciences

You must take the examination at one of two consecutive opportunities upon being accepted to take the FPGEE. Additional opportunities to take the FPGEE will only be allowed if NABP receives an official denial of your visa or you have a health or work-related problem that is substantiated on official stationary from your health provider or place of employment stating that you can not attend your second or subsequent opportunity.

A strong understanding of the following blueprint will aid in your preparation to take the examination.

Area 1 – Basic Biomedical Sciences – 21%

A. Anatomy & Physiology
   1. Structure and function of major body systems; integumentary, muscular skeletal, cardiovascular, lymphatic, respiratory, digestive, nervous, endocrine, urinary, reproductive and body fluid and electrolytes
   2. Molecular aspects of cell biology
   3. Cell physiology and cellular structure and organization

B. Pathology/Pathophysiology
   1. Basic principles and mechanisms of disease including:
      a. Inflammation and repair
      b. Degeneration
      c. Disturbances and hemodynamics
      d. Developmental defects
      e. Neoplasia
   2. Pathophysiology of disease states amenable to pharmacist intervention

C. Microbiology
   1. General principles of microbial concepts
   2. Principles of infectious disease
   3. Host-parasite relationships
   4. Pathogenic micro-organisms of man
   5. Inflammatory responses to infectious agents
   6. Clinical aspects of infection

D. Immunology
   1. Human immunity and immune responses
   2. Principles of antigen-antibody relationships
   3. Molecular biology of immune responses
   4. Genetic basis for antibody synthesis, development, function and immunopathology

E. Biochemistry/Biotechnology
   1. Chemistry of biomacromolecules (proteins, lipids, carbohydrates, and DNA)
   2. Enzymology and co-enzymes and kinetics
   3. Metabolic pathways to energy utilization
   4. Nucleic acid metabolism including DNA replication and repair, RNA and protein synthesis
   5. Recombinant DNA technology

F. Molecular Biology/Genetics
   1. Cell structure and components
   2. Ion channels and receptor physiology
   3. Mitosis and meiosis
   4. Chromosomes and DNA
   5. Gene transcription and translation processes
   6. Recombinant DNA technology

G. Biostatistics
   1. Understanding commonly used statistical tests and their basis

2. Management of data sets
3. Evaluation of statistical results
4. Understanding of statistical versus clinical significance

Area 2 – Pharmaceutical Sciences – 29%

A. Medicinal Chemistry
   1. Physio-chemical properties of drug molecules in relation to drug absorption, distribution, metabolism, and excretion (ADME)
   2. Chemical basis and pharmacology and therapeutics
   3. Fundamental pharmacophores for drugs used to treat disease
   4. Structure activity relationships in relation to drug-target interactions
   5. Chemical pathways of drug metabolism
   6. Application to making drug therapy decisions

B. Pharmacology
   1. Mechanism of action of drugs of various categories
   2. Role of pharmacology in drug choice and the treatment of disease
   3. Pharmacodynamics of drug action and absorption, distribution, metabolism, and elimination
   4. Adverse effects and side-effects of drugs
   5. Drug-target interactions
   6. Drug-drug, drug-food, drug-lab test interactions
   7. Drug discovery and development

C. Pharmacognosy and Alternative and Complementary Treatments
   1. Concepts of crude drugs, semi-purified, and purified natural products
   2. Variability of occurrence of pharmacologically active substances in plants and impact on regulatory aspects of herbal products
   3. Overview of classes of pharmacologically active natural products
   4. Dietary supplements (vitamins, minerals, and herbals)
   5. Alternative medical treatments
   6. Evaluation of alternative and complementary medicine purity, bioavailability, safety, and efficacy
   7. Herbal-drug interactions
   8. Dietary Health Supplement and Education Act and impact on regulation of dietary supplements and herbal products

D. Toxicology
   1. Mechanism of toxicity and toxicokinetics
   2. Acute and chronic toxic effect of xenobiotics on the body including drug or chemical overdose and toxic signs of drugs of abuse
   3. Interpretation of drug screens
   4. Antidotes and approaches to toxic exposures
   5. Functions of poison control centers
   6. Bioterrorism and disaster preparedness and management

E. Bioanalysis/Clinical Chemistry
   1. Fundamentals of laboratory medicine and its importance to screening, diagnosis, and evaluation of patients
   2. Clinical data relevant to disease state management

F. Pharmaceutics/Biopharmaceutics
   1. Physical-chemical principles of dosage forms
   2. Biological principles of dosage forms
   3. Principles of drug delivery via dosage forms (eg, liquid, solid, semi-solid, controlled release, patches, and implants)
   4. Principles of dosage form stability and drug degradation in dosage forms
   5. Materials and methods used in preparation and use of drug forms

G. Pharmacokinetics/Clinical Pharmacokinetics
   1. Basic principles of in vivo drug kinetics (linear and nonlinear)
   2. Principles of bioavailability/bioequivalence
   3. Physiologic determinates of drug onset and duration
   4. Drug, disease, and dietary influences on absorption, distribution, metabolism, and excretion
   5. Clinical pharmacokinetics of commonly used and low-therapeutic-index drugs
   6. The pharmacokinetic-pharmacodynamic interface

H. Pharmacogenomics/Genetics
   1. Genetic basis for disease and drug action
   2. Genetic basis for alteration and drug metabolism
   3. Genome and proteomic principles in relation to disease and drug development
   4. Genetic basis for individualizing drug doses

I. Extemporaneous Compounding/Parenteral/Enteral
   1. United States Pharmacopeia (USP) guidance on compounding and Food and Drug Administration (FDA) Compliance Policy Guidelines
   2. Techniques and principles used to prepare and dispense individual extemporaneous prescriptions including dating of compounded dosage forms
   3. Liquid (parenteral, enteral), solid, semi-solid, and topical preparations
   4. Dosage form preparation calculations
   5. Sterile admixture techniques

a. USP Chapter 797
b. Stability and sterility testing and dating
c. Clean room requirements
d. Infusion devices and catheters

Area 3 – Social/Behavioral/Administrative Pharmacy Sciences – 15%

A. Health Care Delivery Systems
1. Introduction to United States, state, and local health care delivery systems and their interfaces
2. Social, political, and economic factors of the US health care delivery system
3. Principles that influence the distribution of pharmaceutical products and services
4. Role of public and private insurers, pharmaceutical industry, and managed care on health care delivery in the United States
5. Medicare and Medicaid
6. Indigent care programs
7. Incidence of and problems associated with drug overuse, underuse, and misuse in the US health care system

B. Economics/Pharmacoeconomics
1. Economic principles in relation to pharmacoeconomic analysis
2. Concepts of pharmacoeconomics in relation to patient care
3. Applications of economic theories and health-related quality-of-life concepts to improve allocation of limited health care resources

C. Practice Management
1. Management principles (planning, organizing, directing, and controlling pharmacy resources) applied to various pharmacy practice setting and patient outcomes
2. Management of staff within the practice setting including pharmacists, technicians, and other supportive personnel
3. Principles of planning, organizing, directing, and controlling pharmacy resources
4. Tools, including informatics, needed to assess and address change, increase competitiveness, improve quality, and optimize patient services
5. Management of medication use safety systems
6. Strategies to improve continuity of patient care as patients move between health care settings
7. Marketing principles
8. Basic accounting principles
9. Infection control
10. Project management
11. Managing and improving the medication-use process
12. Third-party administration and managed care systems
13. Health care improvement mechanisms at the micro- and macro-system levels

D. Pharmacoepidemiology
1. Application of principles of epidemiology to the study of drug use and outcomes in large populations
2. Studies that provide an estimate of the probability of beneficial effects in populations, or the probability of adverse effects in populations, and other parameters relating to drug use may benefit
3. Methods for continual monitoring for unwanted effects and other safety-related aspects of drugs

E. Pharmacy Law and Regulatory Affairs
1. Legal basis for pharmacy practice
2. Pharmacist's responsibilities and limits under the law
3. Pharmacist's role in reducing liability by reducing drug-related misadventure
4. Civil versus criminal liability
5. Business contract law

F. History of Pharmacy
1. Overview of the evolution of pharmacy as a distinct profession
2. Moving from focus on the drug to focus on the patient and the drug, including clinical, pharmaceutical care and other aspects of patient-provided pharmacist care
3. Major milestones and contributors in the evolution of pharmacy

G. Ethics
1. Principles of professional behavior
2. Ethical issues related to the development, promotion, sales, prescription, and use of drugs
3. Dealing with ethical dilemmas
4. Conflict of interest
5. Ethical issues in delivery of patient-centered care and clinical research
6. Principles of end-of-life care
7. Ethical issues in teamwork

H. Professional Communications
1. Effective verbal and written interpersonal communication
2. Health literacy

3. Communicating with diverse patients, families, pharmacists, and other health professionals in a variety of settings both individually and as a member of a team
4. Interviewing techniques
5. Active listening and empathy
6. Assertiveness and problem-solving techniques
7. Cultural influences on communication of health information
8. Group presentation skills
9. Strategies for handling difficult situations
10. Documentation of pharmacist recommendations and consultations
11. Principles of behavior modification

I. Social and Behavioral Aspects of Practice
1. Pharmacy as a patient-centered profession
2. Patient and other health care providers perceptions of pharmacists' capabilities
3. Role of pharmacist related to patient care
4. Role of pharmacist related to interaction with other health care professionals
5. Development of leadership skills
6. Importance of involvement in pharmacy organizational, regulatory, state, and federal issues

Area 4 – Clinical Sciences – 35%

A. Pharmacy Practice and Pharmacist-Provided Care
1. Overview of the pharmacy profession
2. Issues of contemporary practice
3. Emerging and unique roles for the pharmacist on the health care team
4. Concepts of pharmacist-provided patient care and medication therapy management services
5. Principles of pharmacist-managed, patient-centered pharmacy services
6. Methods of outcome monitoring and assessment techniques
7. Problem identification (eg, duplication, dosage, drug interactions, adverse drug reactions and interactions, frequency, dosage form, indication mismatches) and resolution
8. Role of pharmacy care plans in patient care
9. Monitoring for positive and negative drug therapy outcomes
10. Principles of clinical management of drug toxicity and overdosage
11. Home diagnostic devices

B. Medication Dispensing and Distribution Systems
1. Preparation and dispensing of prescriptions
2. Development and maintenance of patient medication profiles
3. Identification and prevention of medication errors
4. Identification and prevention of drug toxicity
5. Issues of distribution systems associated with all types of practice settings
6. Role of automation and technology in workload efficiency and patient safety
7. Assurance of safety in the medication-use process
8. Medication error reduction programs
9. Continuous quality improvement programs

C. Pharmacotherapy – Practice Guidelines and Clinical Trials
1. Principles of clinical practice guidelines for various disease states and their interpretation in the clinical setting
2. Integration of core scientific and systems-based knowledge in patient care decisions
3. Reinforcement of basic science principles relative to drug treatment protocols and clinical practice guidelines
4. Evaluation of clinical trials that validate treatment usefulness

D. Pharmacotherapy – Health Promotion/Disease Prevention
1. Promotion of wellness and nonpharmacologic therapies
2. Disease prevention and monitoring

E. Pharmacotherapy – Pharmaceutical Care
1. Application of evidence-based decision making to patient care
2. Drug monitoring for positive and negative outcomes
3. Diagnostic tests in the diagnosis, staging, and monitoring of various disease states
4. Concepts of pain management and palliative care
5. Nonprescription drug therapies
6. Dietary drug therapies
7. Designing of patient-centered, culturally relevant treatment plans
8. Drug-induced disease

F. Pharmacist-provided Care for Special Populations
1. Pathophysiologic and pharmacotherapy alterations specific for special population patients (eg, pediatric, geriatric, pregnant, cystic fibrosis, sickle cell anemia, celiac disease, genetic disorders, and others) for prescription and nonprescription medications
2. Dosage calculation and adjustment in special-population patients
3. Drug monitoring for positive/negative outcomes in special-population patients

G. Drug Information
1. Fundamentals of the practice of drug information
2. Application of drug information skills for delivery of pharmaceutical care

3. Technology of drug information retrieval for quality assurance
4. The ability to judge the reliability of various sources of information

H. Medication Safety
1. Causes of medication errors/systems approaches
2. Human factors in errors
3. Strategies for reducing errors
4. Pharmacy leadership in medication safety

I. Literature Evaluation and Research Design
1. Fundamentals of research design and methodology
2. Principles of evaluation of the primary literature
3. Practical implications of the primary literature
4. Principles of research design and analysis in practicing evidence-based pharmacy

J. Patient Assessment Laboratory
1. Obtaining a comprehensive patient history
2. Familiarity with basic assessment techniques (inspection, palpation, percussion, auscultation), terminology, and the modifications caused by common disease states and drug therapy
3. Triage and referral skills
4. Knowledge of therapeutic drug concentrations and their interpretation
5. Knowledge of the basis for common clinical laboratory values and diagnostic tests and the influences of common disease states
6. False positive and false negative results
7. Over-the-counter point-of-care testing devices (eg, glucometers, pregnancy tests, home testing for HbA1c, drug screening)
8. Principles of electrocardiography and common EKG abnormalities
9. Advanced cardiac life support

Sample Questions

Sample Questions

The following questions are typical of those found on the FPGEE. However, their overall difficulty is not necessarily representative of the overall difficulty of the actual examination, nor do they provide a complete overview of the content of the entire 300-item examination. The questions are organized by the four major content areas of the examination. Figures in parentheses indicate the percentage of items that are covered by that area. For example, 21% of the 300 items on the examination relate to Area I, Basic Biomedical Sciences. An answer key is provided on page 13.

Area 1 – Basic Biomedical Sciences – 21%

1. Strand breaking in DNA is primarily due to:

   A. deamination.
   B. loss of a purine and pyrimidine base.
   C. hydrolysis of a phosphodiester bond.
   D. hydrolysis of the N-glycosidic bond.

2. What hormone is primarily responsible for the maintenance of a normal plasma calcium level in mammals?

   A. Glucagon
   B. Thyroxine
   C. Calcitonin
   D. Parathyroid hormone

3. Inflammation from *Propionibacterium acnes* is due in part to the:

   A. production of fatty acids.
   B. hydrolysis of disaccharides.
   C. bacterial release of histamine.
   D. release of purines from DNA degradation.

4. Viruses, bacteria, and parasites evade the immune system by many different mechanisms. When parasites and viruses acquire a coating of host antigens, it is called:

   A. antigen masking.
   B. antigenic variation.
   C. overwhelming the immune system.
   D. hiding inside cells.

5. What is the formula for the K_{eq} of the reaction shown below?

   A. $\dfrac{[C][D]^2}{[A]^2[B]}$

   B. $\dfrac{[C] + [D]^2}{[A]^2 + [B]}$

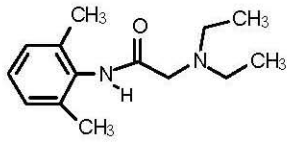
   C. $\dfrac{[C][D] \times 2}{[A] \times 2 \times [B]}$

   D. $\dfrac{[A]^2[B]}{[C][D]^2}$

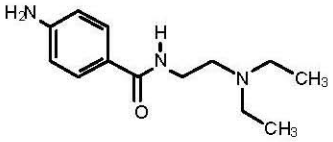
6. Which of the following carbohydrates is a disaccharide?

A. Dextrose
B. Mannose
C. Galactose
D. Maltose

7. Lidocaine has a longer duration of action than procainamide because it:



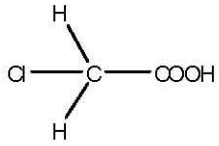
Lidocaine

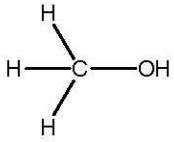


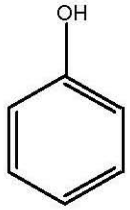
Procainamide

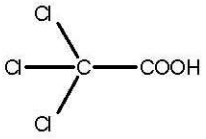
A. lacks a nucleophilic aniline.
B. contains a non-hydrolyzable amide.
C. has more hydrophobic character.
D. is protected from hydrolysis by ortho methyl groups.

8. Which of the following arrangements lists the compounds below in the order of decreasing acidity (most acidic first, least acidic last)?

1.


2.


3.


4.


A. 1 > 2 > 3 > 4
B. 1 > 4 > 3 > 2
C. 3 > 4 > 1 > 2
D. 4 > 1 > 3 > 2

Area 2 – Pharmaceutical Sciences – 29%

9. Rifampin can be responsible for drug-drug interactions because it:

A. inhibits human RNA polymerase.
B. stimulates human RNA polymerase.
C. inhibits hepatic microsomal enzymes.
D. induces hepatic microsomal enzymes.

10. Nystatin functions as an antifungal by:

A. inhibiting mitosis.
B. inhibiting CYP 450 enzymes.
C. interrupting cellular processes.
D. selective disruption of the membrane.

11. The drug which binds to gastric and pancreatic lipases, inhibits their activity, and prevents absorption of dietary fat is:

A. miglitol.
B. sibutramine.
C. acarbose.
D. orlistat.

12. An antibiotic's volume of distribution is 12 L, and its elimination rate constant is 0.25/h.
To maintain a steady state plasma concentration of 10 mcg/mL, what should the infusion rate be?

A. 20 mcg/h
B. 40 mcg/h
C. 10 mg/h
D. 30 mg/h

13. The expiration period for a reconstituted product is 20 hours at room temperature (25°C). What is the approximate expiration period for the same product stored in a refrigerator (5°C)?

A. 25 hours
B. 80 hours
C. 300 hours
D. 450 hours

14. Polysorbate 20 and polysorbate 80 are present in intravenous multivitamin preparations containing vitamins A and D. The polysorbates function as:

A. stabilizers.
B. solubilizing agents.
C. viscosity enhancers.
D. ionic strength adjusters.

15. Which of the following statements best defines adsorption?

A. Diffusion of one compound through the bulk phase of another compound
B. Penetration of a compound from higher concentration to lower concentration
C. Accumulation of a compound at an interface
D. Penetration of a compound from lower concentration to higher concentration

16. The cholesterol in an absorption ointment base with added water acts as:

A. a water-in-oil emulsifier.
B. a micellar solubilizer.
C. an agent to increase viscosity.
D. an agent to increase surface tension.

17. A preservative with a weight to volume ratio of 1:8000 is present in a vaccine that is to be dosed at 0.05 mL/kg of body weight. How many micrograms of preservative is contained in a dose prepared for a 15-kg child?

A. 6.2
B. 43
C. 94
D. 400

18. Patients beginning ciprofloxacin should be counseled that the drug:

A. should be taken with food.
B. should not be taken with antacids.
C. may discolor the urine.
D. may darken the stools.

19. The primary advantage of using insulin lispro over other biotech-produced insulins is:

A. a more rapid onset.
B. fewer immune reactions.
C. a lack of pyrogens.
D. a more prolonged action.

20. The half-life of theophylline (shown in the structure below) is reduced in smokers due to induction of the metabolizing enzyme:

Theophylline

A. COX-1.
B. CYP1A2.
C. phosphodiesterase.
D. monoamine oxidase.

Area 3 – Social/Behavioral/Administrative Pharmacy Sciences – 15%

21. The largest segment of total health-care expenditures is for:

A. medications.
B. hospital care.
C. nursing home care.
D. physician services.

22. A preparation for a Schedule III substance is written March 15 and dispensed April 30. Authorized refills are **not** permitted after:

A. June 14.
B. June 29.
C. September 14.
D. September 29.

23. Which of the following groups may prescribe legend drug products?

A. Dentists
B. Chiropractors
C. Physical therapists
D. Registered dietitians

24. Community-based pharmacists spend the largest percentage of their time:

A. dispensing prescriptions.
B. counseling patients.
C. consulting with physicians.
D. supervising technicians.

25. Persons who are becoming socialized into a profession are most likely to change their:

A. personality traits.
B. attitudes.
C. religious values.
D. parental relationships.

26. The age group that has the highest documented incidence of improper use of medication is composed of individuals:

A. 65 years of age and older.
B. between 30 and 50 years old.
C. between 12 and 21 years old.
D. under 12 years old.

Area 4 – Clinical Sciences – 35%

27. A news report states that the prevalence of type 2 diabetes is 6.6%. What does the 6.6% represent?

A. The sensitivity of diabetes screening at a point in time
B. The accuracy of diabetes screening over a time period
C. Diabetes patients present in the population at a point in time
D. New diabetes patients diagnosed in the population over a time period

28. Which of the following findings is **not** compatible with acute salicylate toxicity in a child?

A. Hypothermia
B. Hyperventilation
C. Tinnitus
D. Tachycardia

29. When dispensing a prescription for methotrexate, the pharmacist should recommend which of the following supplements?

A. Iron
B. Folic acid
C. Riboflavin
D. Cyanocobalamin

30. Which of the following medications is **least** likely to interfere with oral contraceptives?

A. Phenytoin
B. Topiramate
C. Lamotrigine
D. Oxcarbazepine

31. When adding spironolactone to a treatment regimen containing furosemide and lisinopril, it is most important to monitor for:

A. hirsutism.
B. hypotension.
C. hyperkalemia.
D. acute renal failure.

32. A patient with flushed red face, dilated pupils, hot and dry skin, sinus tachycardia, ileus, hallucinations, and combative behavior is most likely to have been poisoned by:

A. a narcotic analgesic.
B. a benzodiazepine.
C. an anticholinergic.
D. a barbiturate.

33. Recent international guidelines recommend that mild, episodic asthma be treated initially with:

A. inhaled corticosteroids.
B. inhaled β_2-agonists.
C. oral theophylline.
D. oral corticosteroids.

34. Results of blood cultures of a 37-year-old IV drug abuser who has endocarditis reveal *Staphylococcus aureus* resistant to oxacillin. An appropriate antistaphylococcal agent for this patient would be:

A. nafcillin.
B. vancomycin.
C. erythromycin.
D. chloramphenicol.

35. Seventy-two of 100 consecutive patients who were admitted to a hospital for treatment of a first myocardial infarction smoked cigarettes. Why would it be inappropriate to conclude that smoking is a risk factor for myocardial infarction?

A. An insufficient number of patients were evaluated.
B. There was no control group.
C. The duration of cigarette smoking was not determined.
D. The gender and race of the patients was not evaluated.

36. In a patient receiving enteral nutrition via nasogastric tube, which of the following is most helpful in preventing aspiration pneumonia?

A. Elevating the head of the bed during feeding
B. Adding methylene blue to the enteral formula
C. Feeding as bolus rather than as continuous infusions
D. Administering prophylactic antibiotics

37. Which of the following is most likely to be toxic if ingested by a child?

A. Barium sulfate
B. Crayons
C. Oil of wintergreen
D. Glycerol

38. The tonic-clonic seizures associated with idiopathic status epilepticus may result in:

A. persistent hypoxia of the central nervous system.
B. abscess in the central nervous system.
C. transient ischemic attack.
D. brain tumor.

39. The major clinical complications of ethylene glycol ingestion develop because of:

A. direct toxicity caused by the substance.
B. toxicity caused by the active metabolites.
C. hypoxia caused by the substance.
D. cardiovascular instability caused by the metabolites.

40. Cyanide produces its toxic action by tightly binding with which of the following enzyme systems?

A. Monoamine oxidase
B. Cytochrome oxidase
C. Acetylcholine esterase
D. Glucose 6-phosphate dehydrogenase

Answer Key

Area I

1 C
2 D
3 A
4 A
5 A
6 D
7 D
8 D

Area II

9 D
10 D
11 D
12 D
13 B
14 B
15 C
16 A
17 C
18 B
19 A
20 B

Area III

21 B
22 C
23 A
24 A
25 B
26 A

Area IV

27 C
28 A
29 B
30 C
31 C
32 C
33 B
34 B
35 B
36 A
37 C
38 A
39 B
40 B

Textbooks Commonly Used in US Pharmacy Schools

The following is a suggested reading list. It does not claim to include all textbooks used in US pharmacy schools but is a guide for your preparation. Many of the books on this list have been published in more than one edition. Please consult a bookstore or a health sciences librarian for more detailed information.

Anderson PO. *Handbook of Clinical Drug Data*. 10th ed. McGraw-Hill Medical; 2001.

Ansel HC, Allen LV, Popovich NG. *Pharmaceutical Dosage Forms and Drug Delivery Systems*. 8th ed. Lippincott Williams & Wilkins; 2004.

Ansel HC, Stoklosa MJ. *Pharmaceutical Calculations*. 12th ed. Lippincott Williams & Wilkins; 2006.

Banker GS, Rhodes CT, Eds. *Modern Pharmaceutics, Drugs & the Pharmaceutical Sciences*. 4th ed. Marcel Dekker; 2004

Berardi RR, Kroon L, McDermott J, et al. *Handbook of Nonprescription Drugs*. 15th ed. APhA Publications; 2006.

Berg JM, Stryer L, Tymoczko JL. *Biochemistry*. 5th ed. W.H. Freeman ; 2002.

Block J, Wilson CO, Beale JM, Gisvold O, Eds. *Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry*. 11th ed. Lippincott Williams and Wilkins; 2004.

Bodenheimer T, Grumbach K. *Understanding Health Policy: A Clinical Approach*. 4th ed. McGraw-Hill 2005.

Bootman JL, Townsend RJ, McGhan WF, Eds. *Principles of Pharmacoeconomics*. 3rd ed. Harvey Whitney Books Company, 2004.

Borgsdorf LR, Selevan JR, Cada DJ, (Eds), et al. *Drug Facts and Comparisons* 60th Ed. 2006. Lippencott Williams & Wilkins; 2004

Brunton L, Lazo J, Parker K. Goodman and Gilman's *The Pharmacological Basis of Therapeutics*. 11th ed. McGraw-Hill Professional; 2005.

Carstensen JT. *Pharmaceutical Principles of Solid Dosage Forms*. CRC Press; 1993.

Cipolle RJ, Strand LM, Morley PC. *Pharmaceutical Care Practice: The Clinicians Guide*. 2nd ed. McGraw-Hill Medical; 2004.

Connors KA, Amidon GL, Stella VJ. *Chemical Stability of Pharmaceuticals: A Handbook for Pharmacists*. 2nd ed. Wiley-Interscience; 1986.

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Preamble and Mission Statement of the National Association of Boards of Pharmacy

Preamble

Given that medications are an integral part of disease management, medication therapies and their delivery systems are becoming more complex, technological enhancements have improved the capabilities for patient monitoring, and entities motivated by economic gain are eroding standards of care, there is greater potential harm to the public and a greater need for patients' medication use to be managed by a licensed pharmacist and state regulatory agencies to aggressively enforce standards of care.

NABP Mission Statement

The National Association of Boards of Pharmacy (NABP) is the independent, international, and impartial Association that assists its member boards and jurisdictions in developing, implementing, and enforcing uniform standards for the purpose of protecting the public health.

NABP Member Boards of Pharmacy

Alabama State Board of Pharmacy
Alaska Board of Pharmacy
Arizona State Board of Pharmacy
Arkansas State Board of Pharmacy
California State Board of Pharmacy
Colorado State Board of Pharmacy
Connecticut Commission of Pharmacy
Delaware State Board of Pharmacy
District of Columbia Board of Pharmacy
Florida Board of Pharmacy
Georgia State Board of Pharmacy
Guam Board of Examiners for Pharmacy
Hawaii State Board of Pharmacy
Idaho Board of Pharmacy
Illinois Department of Financial and Professional Regulation, Division of Professional Regulation – State Board of Pharmacy
Indiana Board of Pharmacy
Iowa Board of Pharmacy
Kansas State Board of Pharmacy
Kentucky Board of Pharmacy
Louisiana Board of Pharmacy
Maine Board of Pharmacy
Maryland Board of Pharmacy
Massachusetts Board of Registration in Pharmacy
Michigan Board of Pharmacy
Minnesota Board of Pharmacy
Mississippi Board of Pharmacy
Missouri Board of Pharmacy
Montana Board of Pharmacy
Nebraska Board of Pharmacy
Nevada State Board of Pharmacy
New Hampshire Board of Pharmacy
New Jersey Board of Pharmacy
New Mexico Board of Pharmacy
New York State Board of Pharmacy
North Carolina Board of Pharmacy
North Dakota State Board of Pharmacy
Ohio State Board of Pharmacy
Oklahoma State Board of Pharmacy
Oregon State Board of Pharmacy
Pennsylvania State Board of Pharmacy
Puerto Rico Board of Pharmacy
Rhode Island Board of Pharmacy
South Carolina Department of Labor, Licensing, and Regulation – Board of Pharmacy
South Dakota State Board of Pharmacy
Tennessee Board of Pharmacy
Texas State Board of Pharmacy
Utah Board of Pharmacy
Vermont Board of Pharmacy
Virgin Islands Board of Pharmacy
Virginia Board of Pharmacy
Washington State Board of Pharmacy
West Virginia Board of Pharmacy
Wisconsin Pharmacy Examining Board
Wyoming State Board of Pharmacy

Australia:

Pharmacy Board of New South Wales*
Pharmacy Board of Victoria*

Canada:

Alberta College of Pharmacists*
College of Pharmacists of British Columbia*
Manitoba Pharmaceutical Association*
New Brunswick Pharmaceutical Society*
Nova Scotia College of Pharmacists*
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Prince Edward Island Pharmacy Board*
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