

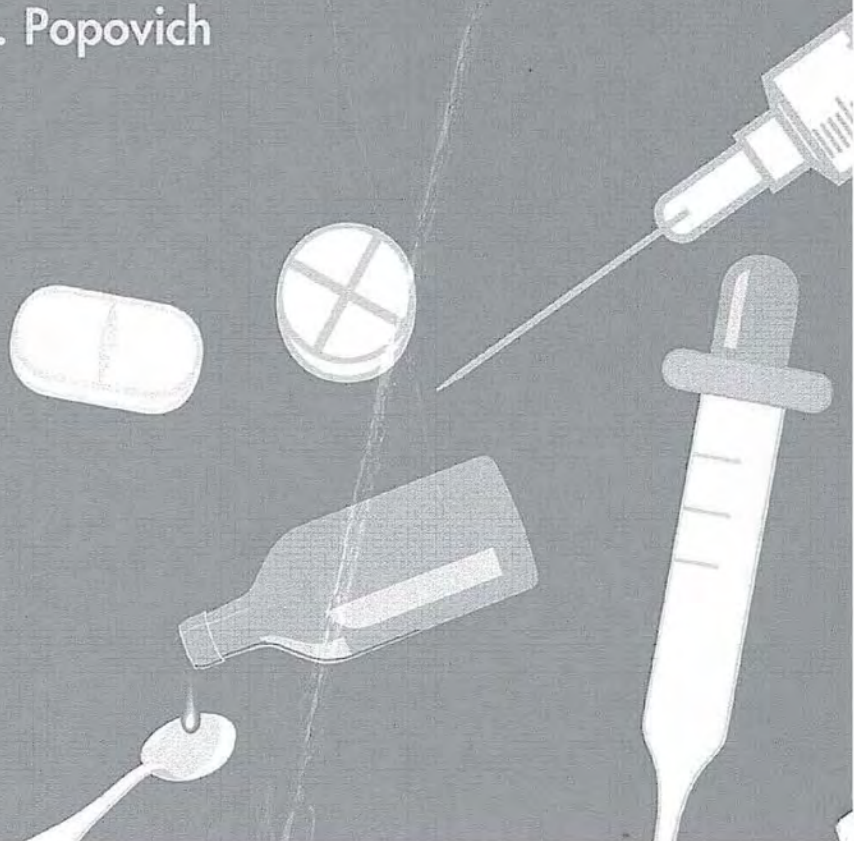
SEVENTH EDITION

# PHARMACEUTICAL DOSAGE FORMS AND DRUG DELIVERY SYSTEMS

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# Contents

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Preface	v
Acknowledgments	vii
<b>Section I. PRINCIPLES OF DOSAGE FORM DESIGN AND DEVELOPMENT</b>	
1 Introduction to Drugs and Pharmacy	1
2 New Drug Development and Approval Process	23
3 Dosage Form Design: Pharmaceutic and Formulation Considerations	60
4 Dosage Form Design: Biopharmaceutic and Pharmacokinetic Considerations	101
5 Current Good Manufacturing Practices and Good Compounding Practices	142
<b>Section II. SOLID DOSAGE FORMS AND MODIFIED-RELEASE DRUG DELIVERY SYSTEMS</b>	
6 Powders and Granules	164
7 Capsules and Tablets	179
8 Modified-Release Dosage Forms and Drug Delivery Systems	229
<b>Section III. SEMI-SOLID AND TRANSDERMAL SYSTEMS</b>	
9 Ointments, Creams, and Gels	244
10 Transdermal Drug Delivery Systems	263

<b>Section IV. PHARMACEUTICAL INSERTS</b>	
<b>11</b> Suppositories and Inserts	279
<b>Section V. LIQUID DOSAGE FORMS</b>	
<b>12</b> Solutions	296
<b>13</b> Disperse Systems	346
<b>Section VI. STERILE DOSAGE FORMS AND DELIVERY SYSTEMS</b>	
<b>14</b> Parenterals	397
<b>15</b> Biologicals	450
<b>16</b> Ophthalmic Solutions and Suspensions	469
<b>Section VII. NOVEL AND ADVANCED DOSAGE FORMS, DELIVERY SYSTEMS, AND DEVICES</b>	
<b>17</b> Radiopharmaceuticals	487
<b>18</b> Products of Biotechnology	503
<b>19</b> Novel Dosage Forms and Drug Delivery Technologies	535
<b>Appendix</b>	
Systems and Techniques of Pharmaceutical Measurement	552
<b>Index</b>	563

## PARENTERALS

### Chapter at a Glance

#### Injections

##### *Parenteral Routes of Administration*

- Intravenous Route
- Intramuscular Route
- Subcutaneous Route
- Intradermal Route
- Specialized Access

##### *Official Types of Injections*

##### *Solvents and Vehicles for Injections*

##### *Nonaqueous Vehicles*

##### *Added Substances*

##### *Methods of Sterilization*

- Steam Sterilization
- Dry-Heat Sterilization
- Sterilization by Filtration
- Gas Sterilization
- Sterilization by Ionizing Radiation

##### *Validation of Sterility*

- Pyrogens and Pyrogen Testing

##### *The Industrial Preparation of Parenteral Products*

##### *Packaging, Labeling, and Storage of Injections*

##### *Quality Assurance for Pharmacy-Prepared Sterile Products*

##### *Available Injections*

#### Small Volume Parenterals

- Insulin Injection (Regular)*
- Human Insulin*

##### *Lispro Insulin Solution*

##### *Isophane Insulin Suspension (NPH Insulin)*

##### *Isophane Insulin Suspension and Insulin Injection*

##### *Insulin Zinc Suspension*

##### *Extended Insulin Zinc Suspension*

##### *Prompt Insulin Zinc Suspension*

##### *Insulin Infusion Pumps*

#### Large Volume Parenterals (LVPs)

##### *Maintenance Therapy*

##### *Replacement Therapy*

##### *Water Requirement*

##### *Electrolyte Requirement*

##### *Caloric Requirements*

##### *Parenteral Hyperalimentation*

##### *Enteral Nutrition*

##### *Intravenous Infusion Devices*

#### Special considerations associated with parenteral therapy

##### *Adsorption of Drugs*

##### *Handling/Disposal of Chemotherapeutic Agents for Cancer*

#### Other Injectable Products—Pellets or Implants

##### *Levonorgestrel Implants*

#### Irrigation and Dialysis Solutions

##### *Irrigation Solutions*

##### *Dialysis Solutions*

CONSIDERED IN this chapter are important pharmaceutical dosage forms that have the common characteristic of being prepared to be sterile; that is, free from contaminating microorganisms. Among these sterile dosage forms are the various small- and large-volume injectable preparations, irrigation flu-

ids intended to bathe body wounds or surgical openings, and dialysis solutions. Biological preparations as vaccines, toxoids, and antitoxins are also among this group and discussed in Chapter 15. Sterility in these preparations is of utmost importance because they are placed in direct contact with

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