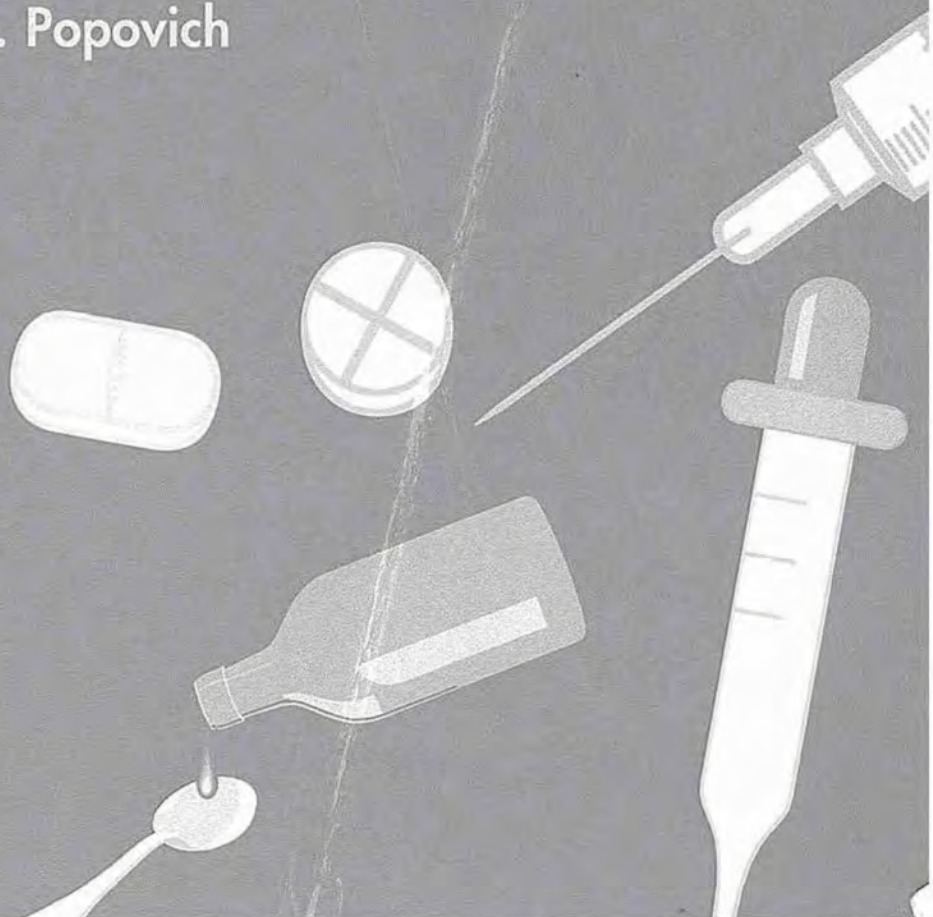


SEVENTH EDITION
**PHARMACEUTICAL
DOSAGE FORMS
AND DRUG
DELIVERY SYSTEMS**

Howard C. Ansel
Loyd V. Allen, Jr.
Nicholas G. Popovich



Editor: Donna Balado
Managing Editor: Jennifer Schmidt
Marketing Manager: Christine Kushner

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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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