

CHAPTER 1

INTRODUCTION TO PHARMACEUTICS

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1.1 Overview of Pharmaceutics

Pharmaceutics is the branch of pharmaceutical sciences concerned with the formulation of a pure drug substance into a dosage form suitable for administration to patients. The active pharmaceutical ingredient (API) may have potent therapeutic activity, but unless it is transformed into a form that ensures stability, accurate dosing, and proper absorption, it cannot be effectively used in medical practice.

Pharmaceutics provides the scientific foundation for:

Formulation: converting APIs into tablets, capsules, injections, suspensions, aerosols, ointments, patches, and advanced delivery systems.

Drug Delivery: ensuring that the drug reaches its site of action at an adequate concentration and for an appropriate duration.

Stability and Quality: protecting drugs from degradation (chemical, physical, or microbiological) during manufacturing, storage, and distribution.

Patient-Centered Therapy: designing dosage forms that are easy to administer, palatable, and convenient for different patient populations (children, elderly, patients with swallowing difficulties, etc.).

In short, pharmaceutics transforms a pharmacologically active molecule into a therapeutically useful medicine.

1.2 Historical Development of Pharmaceutics

The practice of drug formulation dates back thousands of years:

Ancient Era: Egyptian papyri (Ebers Papyrus, 1500 BCE) contained recipes for herbal preparations. In India, Ayurvedic medicine described powders, decoctions, and oils, while Traditional Chinese Medicine included herbal extracts and animal-based products. Greek physicians like Hippocrates emphasized rational approaches to treatment.

Middle Ages: The rise of the apothecary profession led to specialized compounding and dispensing of medicines. Islamic scholars such as Avicenna