
HMX Fundamentals Pharmacology

Understanding how drugs act in the body is vital for effectively treating patients. This course covers the principles governing how drugs and other therapeutics impact the body, and shows how they are used in the treatment and prevention of diseases and disorders. Participants will:

- Learn about fundamental concepts in pharmacology, including routes of administration, pharmacokinetics and pharmacodynamics
- Understand the factors behind drug toxicity and adverse drug reactions
- See how pharmacology principles are applied in real-life scenarios, clinical settings, and drug discovery and development

Topics Covered

Course Overview

- Course introduction
- Meet the faculty

Pharmacology and Therapeutics

- Drug nomenclature
- Drug classes
- Drug modalities
- Routes of administration

Pharmacokinetics I

- Absorption
- Bioavailability
- Distribution
- Body compartments
- Volume of distribution

Pharmacokinetics II

- Phase 1 and 2 reactions
- First-pass metabolism
- Excretion
- First- and zero-order kinetics
- Therapeutic window

Targets of Drug Action

- Common drug mechanisms
- Receptors, enzymes, ion channels, and transporters
- New drug mechanisms
- Protein-based, gene-based, and cell-based therapies

Pharmacodynamics

- Receptor and ligand binding
- Dose response relationships
- Individual variation
- Pharmacogenetics

Drug Toxicity

- Toxic and lethal dosing
- Mechanisms of drug toxicity
- Drug interactions
- Adverse drug reactions

Drug Discovery and Development

- Drug discovery and design
- Preclinical drug development
- Clinical drug development

Each HMX course is designed to give learners a solid foundation in the basic science principles that are relevant to human health and disease. Concepts are taught using whiteboard-style videos and animations and reinforced by interactive elements, true-to-life scenarios, and real patient cases to enhance learning.