



## SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

Coimbatore -641035

COURSE NAME: PHARMACOLOGY (ER20-22 T)

YEAR : IIYEAR

TOPIC 1 : INTRODUCTION TO PHARMACLOGY





#### **PHARMACOLOGY**

Pharmacology

#### Historical Origins of Pharmacology

Study of drugs and their effects on the body.

Derived from Greek: *pharmakon* 

(drug) and *logos* (study).

Two main branches:

Pharmacodynamics and Pharmacokinetics.

The study of drug actions Drug Preparation Compounding medications traditionally Natural Sources Origins of drugs from nature Mortar and Pestle Symbol of traditional drug preparation





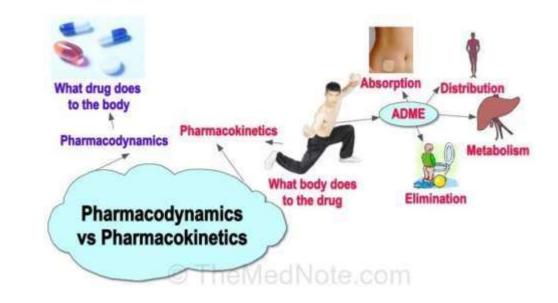
#### **BRANCHES OF PHARMACOLOGY**

**Pharmacodynamics**: What the drug does to the body.

**Pharmacokinetics**: What the

body does to the drug.

Other areas: Clinical pharmacology, toxicology, pharmacognosy.







# Key Terms to Know

- **Drug**: Substance used to diagnose, treat, or prevent disease.
- **Dose**: Amount of drug given at one time.
- **Efficacy**: Ability of a drug to produce desired effect.
- Side Effect: Unintended effect of a drug.





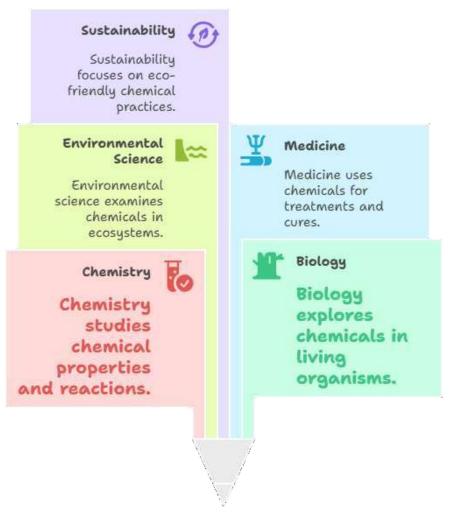
### Chemical Foundations of Progress

### **HOW ARE DRUGS CLASSIFIED**

By chemical structure (e.g., penicillins).

By therapeutic use (e.g., analgesics for pain).

By body system affected (e.g., cardiovascular drugs).







### **ROUTES OF DRUG ADMINISTRATION**

**Oral**: Swallowed (e.g., tablets, capsules).

**Topical**: Applied to skin or mucous membranes.

Parenteral: Injected (e.g., IV, IM).

**Inhalation**: Breathed in (e.g., asthma inhalers).

Choose the best route of drug administration for patient convenience and accessibility.



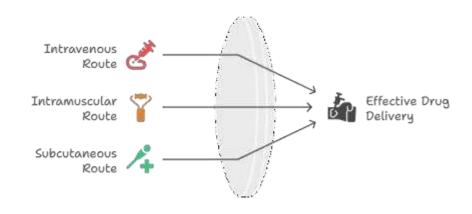




Most common, easily identifiable

Requires medical expertise

#### Parenteral Administration Pathways







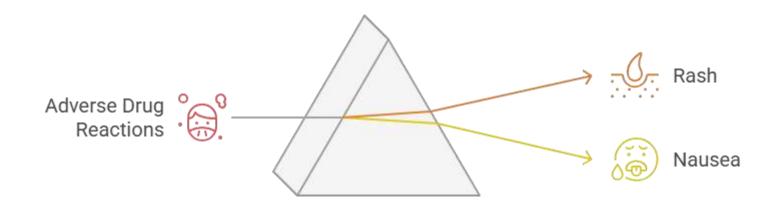
### **TYPES OF DRUG EFFECTS**

**Therapeutic**: Desired effect (e.g., lowering blood pressure).

**Side Effects**: Unwanted effects (e.g., nausea).

Toxic Effects: Harmful effects due to overdose.

### **Exploring Adverse Drug Reactions**







### **PHARMACODYNAMICS: WHAT DRUG DO**

Study of drug effects on the body.

Focuses on mechanism of action and therapeutic effects.

Example: Paracetamol reduces pain by acting on the

brain.



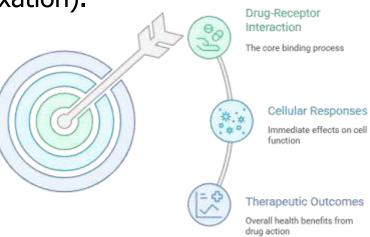


### **HOW DRUG WORKS: RECEPTOR**

Drugs bind to specific receptors in the body. Receptors are like locks; drugs are the keys.

Binding triggers a response (e.g., pain relief, muscle relaxation).

**Drug-Receptor Interaction** 







### **PHARMACOKINETICS: BODY'S ROLE**

Study of how the body processes drugs. Four main processes: Absorption, Distribution, Metabolism, Excretion (ADME).



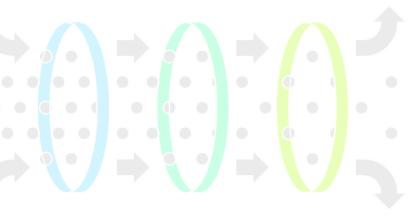


### **ABSORPTION**

Process of drug entering the bloodstream.

Depends on route (e.g., oral drugs absorbed in stomach/intestines). Factors: Food, pH, drug formulation.

#### **Drug Absorption Process**



#### Stomach Dissolution

Drug begins to break down

#### Small Intestine Absorption

Drug molecules enter bloodstream

#### Bloodstream Circulation

Drug is transported throughout the body





### **DISTRIBUTION**

Movement of drug from blood to tissues/organs. Affected by blood flow and tissue barriers (e.g., brain barrier). Example: Antibiotics spread to infected tissues.

### **Drug Distribution Process**







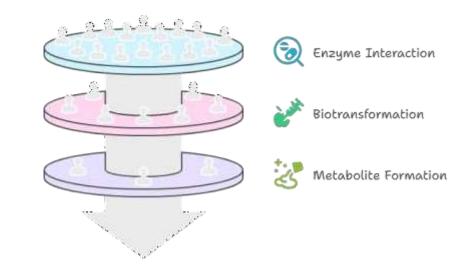
### **METABOLISM**

Body breaks down drugs into inactive forms.

Mainly occurs in the liver (enzymes like cytochrome P450). Example:

Paracetamol is metabolized into non-toxic compounds.

#### Drug Metabolism in the Liver



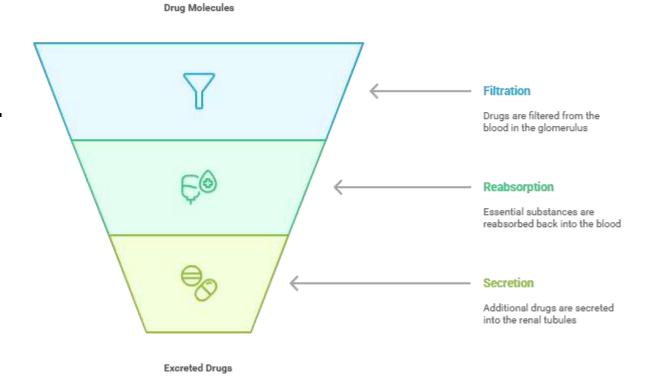




#### **Drug Excretion Process in Kidneys**

### **EXCRETION**

Removal of drugs from the body. Mainly via kidneys (urine). Other routes: Lungs, sweat, bile.







### **DRUG HALF LIFE**

Time taken for half the drug to be eliminated.

Helps determine dosing frequency.

Example: Ibuprofen half-life is 2 hours.





### **FACTORS AFFECTING DRUG ACTION**

Age, weight, gender.

Disease state (e.g., liver or kidney issues).

Drug interactions (e.g., one drug blocks another).





### **DRUG INTERATION**

Occur when one drug affects another.

Types: Synergistic (enhanced effect), antagonistic (reduced effect).

Example: Alcohol increases sedative effects of sleeping pills.





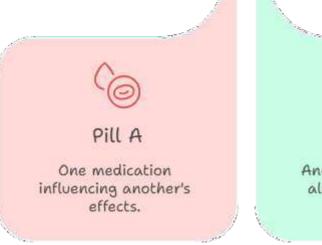
### **ADVERSE DRUG INTERACTION**

### Understanding Medication Combinations

Unwanted or harmful effects.

Range from mild (e.g., rash) to severe (e.g., anaphylaxis).

Pharmacists monitor and report ADRs.









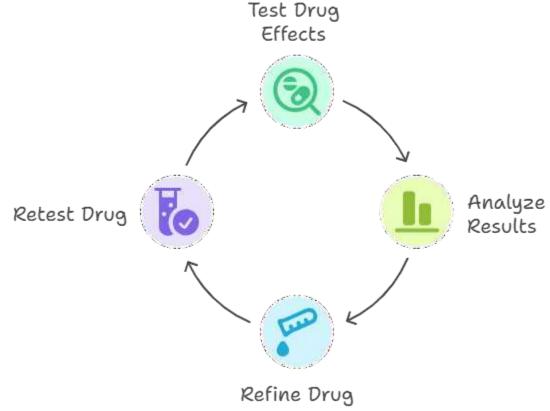
### **ROLE OF PHARMACIST IN PHARMACOLOGY**

### Drug Discovery Cycle

Ensure safe and effective drug use.

Counsel patients on proper medication use.

Monitor for side effects and interactions.



# THANK YOU