




Introduction to Pharmacology

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Intended Learning Outcome

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Define
Pharmacology



Define common
terminologies used
in Pharmacology &
Therapeutics

Introduction

Pharmacology: Branch of pharmaceutical sciences concerned with

Study of drugs origin, composition, pharmacokinetics, therapeutic use, and toxicology

Properties and reactions of drugs in relation to their therapeutic value

(Merriam-Webster. Merriam-Webster's Medical Desk Dictionary)



Terminologies Used In Pharmacology & Therapeutics



Pharmacokinetics: What the drug does to the body.

- Absorption, distribution, metabolism and excretion of the drug

Pharmacodynamics: Physiological and biochemical effects of drugs and their mechanism of action at various levels.

Pharmacogenetics: Study of genetic influences on responses to drugs.

Pharmacogenomics: Use of genetic information to guide choice of drug therapy in individuals



Other Common Terminologies




Pharmacotherapeutics:



Application of pharmacological information together with knowledge of the disease for its prevention, mitigation or cure.

- Drug choice, dosage and duration of treatment considering the disease and patient's characteristics.

Therapeutics: Branch of medical science dealing with the application of various remedies to diseases.



Definition Related to Pharmacology



Pharmacy: Art and science of compounding and dispensing drugs. Includes collection, identification, purification, isolation, synthesis, standardization and quality control of medicinal substance.

Pharmaceutics: Primarily technological science. Deals with large scale manufacture of drugs.

Pharmacopoeia: Official publication containing a list of drugs and medicinal preparations approved for use, their formulae and other information needed to prepare a drug; their physical properties, tests for their identity, purity and potency.

- Indian Pharmacopoeia (IP), British Pharmacopoeia (BP) and United States Pharmacopoeia (USP)

Definition of common terms

- **Pharmacotherapeutics:** Study of the therapeutic uses and effects of drugs
 - **Clinical Pharmacology:** Scientific study of drugs including Pharmacodynamic and pharmacokinetic investigation in healthy volunteers and patients.
 - **Chemotherapy:** Treatment of systemic infections and malignancies with specific drugs that have selective toxicity for the infective organism/malignant cell with no or minimal effects on the host cells.

Components of Clinical Pharmacology

Drug pharmacodynamics and pharmacokinetics in humans

Evaluation of efficacy and safety of drugs

Surveillance of patterns of drug use and adverse effects

Pharmacotherapy

Rational drug use

Drug therapy in special populations (e.g. pregnancy, lactation, neonates and elderly patients)

Pharmacogenomics



Definition of Toxicology



Study of poisonous effects of drugs and other chemicals.

Including household, environmental pollutant, industrial, agricultural, homicidal. Emphasis is on detection, prevention and treatment of poisonings.

Includes study of adverse effects of drugs.

- A substance can be a drug or a poison, depending on condition of its use, dose, and person using it.
 - If a drug helps the body, it is a medicine.
 - If a drug causes a harmful effect to the body, it is a poison.



What is a Drug



A Drug: Any substance or product used to modify, explore physiological systems, treat or prevent diseases.

'WHO'



"all chemicals other than food that affect living processes"

Drug Nomenclature

Chemical name; (naphthyloxy) propan-2-ol.

Non-proprietary name: propranolol

Proprietary (Brand) name:

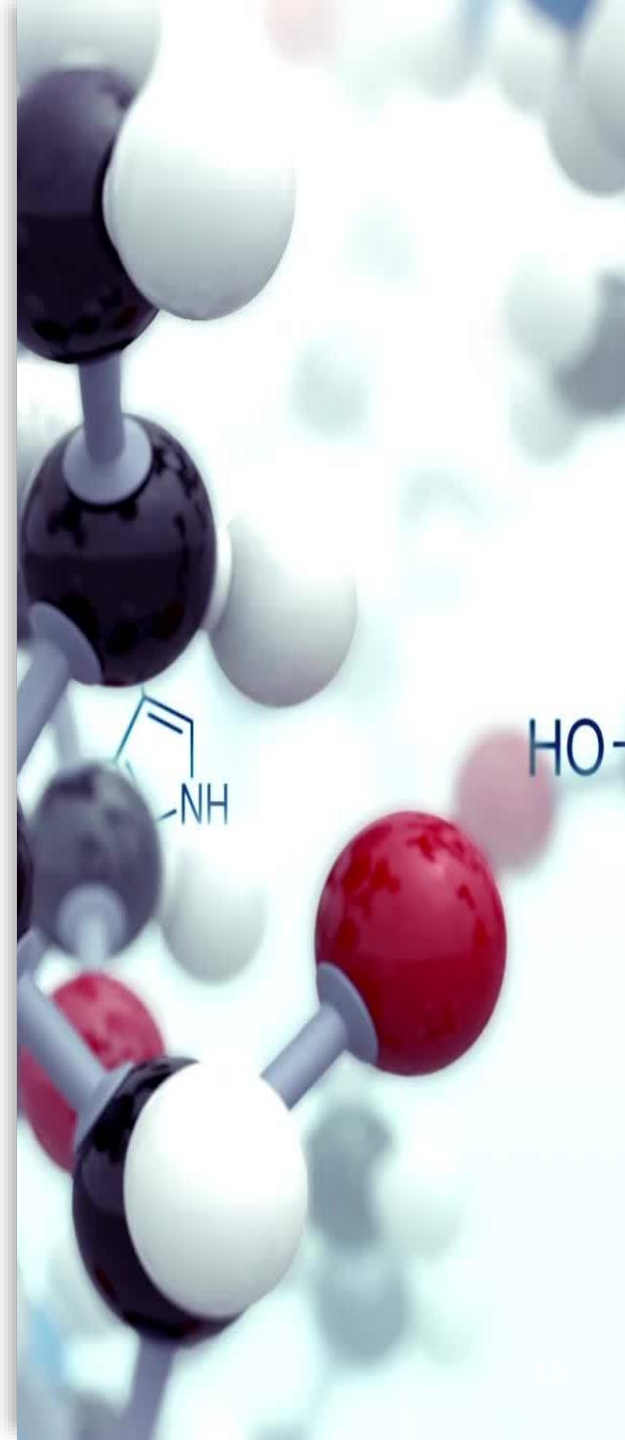
May have many proprietary names. E.g Sumial, Anaprilin for propranolol

Drug Names: Chemical name

Drug's chemical composition and molecular structure

Assigned according to rules of nomenclature of chemical compounds

E.g: Paracetamol is N-(4-hydroxyphenyl) ethanamide [aka N-(4-hydroxyphenyl) acetamide]



Drug Names: Generic name (non- proprietary name)

Name accepted by a competent scientific body/authority

- E.g. the United States Adopted Name (USAN) and British Approved Name (BAN).

Derived from the chemical name irrespective of its manufacturer

- E.g: Paracetamol (USA: Acetaminophen)

Standardization: International Non-proprietary Name (INN) in all member countries of the WHO.

- 'meperidine' and 'pethidine' or 'lidocaine' and 'lignocaine'

Drug Names: Proprietary (Brand) name

Assigned by manufacturer(s) as their property or trademark.

use of the name restricted by the drug's patent owner (Usually manufacturer)

E.g: Panadol, Tylenol

Drug Classification: Pharmacological action

- 1. Chemotherapeutic agents:** Designed to inhibit/kill invading parasites/malignant cells and have no/minimal Pharmacodynamic effects in the recipient.
 - Treat infectious diseases and cancer
- 2. Pharmacodynamic agents:** Designed to have Pharmacodynamic effects in the recipient.
 - Non-infectious diseases

Essential Medicines:

- The WHO has defined 'Essential Drugs' as 'those that satisfy the priority health care needs of the population.'
- Available in :
 - Adequate amounts
 - Appropriate dosage forms
 - Assured quality and adequate information
 - At a price individuals and the community can afford.

Orphan Drugs



For diagnosis/treatment/prevention of a rare disease or condition, or common in resource poor countries.



Life saving but commercially difficult to obtain.



No profit from developing and marketing drug will be recovered from the sales of that drug.



E.g: Fomepizole (**methanol or ethylene glycol poisoning**), digoxin immune Fab (digoxin toxicity), Liothyronine (T3) (**hypothyroidism**)



Governments in developed countries offer incentives to Pharmaceutical companies for developing and marketing orphan drugs.

E.g. Orphan drug Act in USA



Factors affecting route of administration

1. Physical and chemical properties of the drug (Solid,/Liquid/gas; solubility; stability; pH, irritancy)
2. Site of desired action-localized and approachable or generalized and not approachable.
3. Rate and extent of absorption of the drug from different routes
4. Effect of digestive juices & first pass metabolism on the drug
5. Rapidity with which the response is desired
6. Accuracy of dosage required (Intravenous, inhalation)
7. Condition of the patient (Unconscious, vomiting)



END
***Thank you for your
attendance.***