Ibn Sina University of Medical & Pharmaceutical Sciences

Faculty of Dentistry

Chapter One

General Pharmacology
October 2019

Dr. Aws Anees Hassan

MPharm MSc ARPharmS ACIM

1.1 Introduction and General definitions

The main objective behind teaching pharmacology is to provide a rationale for choosing and prescribing drugs skilfully. Dental practitioners use drugs not only for dental problems but also for the management of medical emergencies at the clinic. Dentists should also have a sound knowledge of pharmacology of other drugs in order to prevent the chances of drug-drug interactions, which the patient may be taking for co-morbid conditions.

Pharmacology: It is the science that deals with the effects of drugs on living system.

Drug: World Health Organisation (WHO) defines a drug as 'any substance or product that is used or intended to be used to modify or explore physiological systems or pathological states for the benefit of the recipient'.

Pharmacokinetics: It means 'what the body does to the drug. It includes the processes of **absorption** (**A), distribution (D), metabolism (M) and excretion (E)**

Pharmacodynamics: It is the study of drugs—their mechanism of action, pharmacological actions and their adverse effects. It covers all the aspects relating to 'what the drug does to the body'.

Pharmacy: It is the branch of science that deals with the preparation, preservation, standardization, compounding and proper utilization of drugs.

Therapeutics: It is the aspect of medicine that is concerned with the treatment of diseases.

Chemotherapy: It deals with the treatment of infectious diseases/cancer with chemical compounds that have relatively selective toxicity for the infecting organism/ cancer cells.

Toxicology: It is the study of poisons, their actions, detection, prevention and the treatment of poisoning.

Clinical pharmacology: It is the systematic study of a drug in humans—both in healthy volunteers and patients, It includes the evaluation of pharmacokinetic and pharmacodynamic data, safety, efficacy and adverse effects of a drug by comparative clinical trials.

Orphan drugs: Drugs that are used for the diagnosis, treatment or prevention of rare diseases.

Over-the-counter drugs (OTC drugs): OTC or non-prescription drugs are the drugs that can be sold to a patient without the need for a doctor's prescription, e.g. paracetamol, antacids, etc.

Prescription drugs: These are the drugs that can be obtained only upon producing a prescription by a registered medical practitioner, e.g. antibiotics, antipsychotics, etc.

1.2 Sources of Drugs

They can be classified into: **natural, semisynthetic and synthetic**.

Natural drugs: It can be obtained from plants, animals, minerals and microorganisms.

A) Plants: morphine, atropine and quinine.
B) Animals: Insulin, heparin.
C) Minerals: Ferrous sulphate, magnesium sulphate.
D) Microorganisms: Penicillin, streptomycin

Semisynthetic drugs are obtained from natural sources and are chemically modified later such as Hydromorphone, hydrocodone.

Synthetic drugs are artificially produced, most of the drugs used today are synthetic such as aspirin, paracetamol. Drugs are also produced by genetic engineering (DNA recombinant technology), such as human insulin, human growth hormone, hepatitis B vaccine.

1.3 Drug Nomenclature

Drugs usually have three types of names. They are as follows:

Chemical Name	Non-proprietary name	Brand/Trade Name
N-acetyl-p-aminophenol	**Paracetamol**	**Paracetol, Panadol.**

1. Chemical name: It denotes the chemical structure of the drug, e.g. N-acetyl-p-aminophenol is the chemical name for paracetamol.

2. Non-proprietary name: It is assigned by a competent scientific body/authority, e.g. the United States Adopted Name (USAN) council. It is commonly used as **generic name**. It should be used ideally in prescriptions because it is economical and uniform all over the world than the branded counterparts, e.g. aspirin and paracetamol are generic names.

3. (Brand name): It is given by the drug manufacturers. Brand names are short and easy to recall. A drug usually has many brand names—it may have different names within a country and in different countries. Brand names can also be used in prescriptions, e.g. Paracetol is a brand name of paracetamol.