

# **DEFINITION OF PHARMACOLOGY; DRUGS; CLASSIFICATION AND NAMING**

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# DEFINITION AND DIVISIONS

➤ **PHARMACOLOGY** : It is the science that deals with interaction of drugs with living systems.

**Drugs** : These are chemical substances that shows biological activity (treatment or sometimes diagnosis).

النظام الشعبة  
CT scan

➤ **Divisions of Pharmacology:**

## 1. Pharmacodynamics :



(Pharmacodynamics:-)  
1- type or quality of the action  
2- quantitative aspect  
3- mechanism of action  
4- adverse effect and safety

(What the drug does to the body)

paraCetamol works on "chochos" enzymes (I, II, III) by inhibit the enzyme

ملاحظة افضل  
للفقرة

○ This deals with the action of drugs on living tissues , namely the type or quality of action, its quantitative aspect , as well as the mechanism of action .

- Adverse effects and safety of drugs on body tissues or systems are also included

- The main organ or tissue on which the drug acts , and for which it is used therapeutically, is called the **target organ or tissue of drug action**

definition

## 2. Pharmacokinetics:



(What the body does to drug)

- This includes *إعطاس!* administration and *not adsorption* absorption of drugs, their distribution inside body, and their elimination by metabolism or excretion

elimination | *ilmīneifn* | noun

1. (removal) قَضَاء, إزالة

2. (ruling out) اسْتِبْعَاد





# OTHER TOPICS LINKED WITH PHARMACOLOGY

**1. Pharmacotherapeutics:** It is concerned with the proper use of drugs in treatment of disease in man

BNF → Book  
\*الكتاب الوطني\*

British National F... (?)

**2. Clinical Pharmacology:** This includes :-

perfedgan (paracetamol in IV)  
→ أمن علاج الهمى شرق ادرسية

A. Drug pharmacology

evaluation | | valjo' efn | ngn

B. Clinical evaluation of drugs in treating disease

تقييم (تقييمات) تقدير (تقديرات, تقادير)

in man. This is done by :



a. Clinical trials

دراسات المراقبة

b. Surveillance studies

imply | sm'plaz | transitive verb

1. (to insinuate) (عنى; أشارَ إلى), (ألمحَ إلى), (عنى)

2. (to involve) (تضمنَ, انطوى على)

**3. Chemotherapy :** It is used to imply the use of drugs to inhibit growth or kill either :

a. Microbes (i.e. anti-microbial agents)

chemotherapy

نوع من

antibiotic ←

b. Cancer cells ( Cyto-toxic anti-cancer drugs)

chemo-ther. نوع من



# DRUG SOURCES

These may be either :-

*in Labs or factories*

## I. Synthetic sources : common at present

- these drugs are prepared by the labs or factories of the pharmaceutical industry. Nowadays, computers greatly assist in discovery of new drugs

## II. Semi-synthetic drugs :

- these are obtained from natural sources, but are modified by pharmaceutical industry in order to improve their physical or chemical properties or pharmacological activity.

*عشبة + تعديل على خصائصها*

*quinine*  
*antimalarial*

*active  
ingredient*

*بدي أخذ*

*مثل زيت القزح حذر ✓*  
*لا تتحوّل لا*  
*لا تتحوّل ساعة*  
*لا يتحوّل*  
*التخزين لوقت طويل*

**III. Natural sources:** These are **less used now**. They may be either:

**1. Organic:**

**A. Plants:** Any part of the plant (stem, leaves, flowers, seeds, roots) may be used to **extract active ingredients** for drugs; same plant may contain **more than one active principle**. All of this is dealt with in **PHARMACOGNOSY**

pharmacognosy | ˌfɑːməˈkɒɡnəsi | noun

• the branch of knowledge concerned with medicinal drugs obtained from plants or other natural sources.

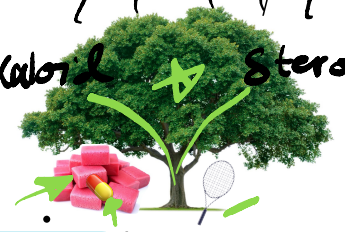


Examples of drugs from plants are: **alkaloids, steroids,** some **vitamins, tannins, volatile oils, gums**

*مركبات*

*alkaloid steroid*

[●REC]



**Note:**

**Alkaloids** are **small organic molecules** containing **nitrogen**. e.g. atropine, morphine, caffeine, theophylline, quinine

*anti malaria*

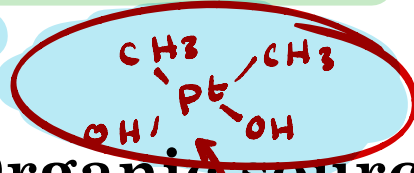
*anti asma*

*heart failure*  
[detoxa  
ج. د. د. د.]

**B. Animals :** these may include either **proteins**, **oils**, **enzymes from exocrine glands**, **hormones**, **vaccines** and **anti-sera**, and some **vitamins**

**C. Microbes :** like **fungi**, and sometimes **bacteria** which are **sources of antibiotics**

علاج معظم أنواع السرطان



## 2. Non-Organic sources :

- metals : Platinum, **Zinc**

- non-metals : Sodium chloride , **magnesium sulfate**

Normal Saline

0.9%



antacid



## Rational drug design:

- This implies the ability to predict the chemical structure of drug molecule on basis of 3-dimensional structure of its receptor, employing at present suitable computer programs. Only few drugs in clinical use at present were developed in this rational way.
- Most drugs were in the past developed through random testing of chemicals, or modified molecules of known drugs that are known to have some pharmacological effect.

**However, as more becomes known about detailed structure of receptors, rational drug design with the aid of computers would become more feasible**

# DRUG CLASSIFICATION



**There is no fixed rule;** classification is usually done according to their :

**1. Therapeutic use :** e.g. anti-hypertensive drugs ; anti-microbial drugs ; anaesthetics; hypoglycemic drugs; anticoagulants;

## **2. Type of pharmacological action :**

This should be precise. e.g. local or general anaesthetics; vasodilators; anticoagulants **OR** according to molecular or cellular site of action in target cells e.g. enzyme inhibitors, receptor blockers , ion channel blockers, inhibitors of transporters, antimicrobials acting on cell wall, DNA, or ribosomes

مضادات الميكروبات

**3. Physiological systems on which they act :** Drugs acting on cardio-vascular system; drugs acting on GIT or CNS or respiratory system

**4. Chemical nature or Source :**

Common chemical groups or structures can be used to classify drugs that have similarity in their pharmacological profile e.g. benzodiazepines, steroids.

Lexotanil  
Chromoprazam

For drugs derived from nature, both the plant species or genus and drug chemistry are included e.g. belladonna alkaloids from *atropa belladonna* , digitalis glycosides from *Digitalis* leaves .

تكون الكلمة الاصلية

اسم النبات ثم التركيب الكيميائي  
منه انواع



# DRUG NAMES

## 1. Chemical name : *very rare*

- Because of its complexity , the chemical structure is not usually used to name drugs.
- However, sometimes a shorthand name based on a simple chemical structure is employed e.g. **acetylsalicylic acid** (aspirin) , **acetaminophen** (parectamol)



## 2. Generic (non-proprietary) name : *very important*

- This is a unique name that is given by official pharmaceutical bodies;
- It is present in *دساتير الأدوية* **pharmacopeas** (BP or USP). *British USA*
- It is the approved scientific name, and must be used in **scientific publications** as well as in prescriptions esp. in hospitals .
- Its use makes it easier for pharmacist to choose from many available brands of same drug.
- **Only few drugs show more than one generic name :**
  - Nor*adrenaline & adrenaline in UK but are named *Nor*epinephrine and epinephrine, respectively, in USA & WHO; *sal*butamol in UK while *al*buterol in USA *→ America*
- **Generic names of drugs in a classified group may have common endings** e.g. – **olol** for beta-adrenoceptor blockers; **-caine** for local anaesthetic drugs. These endings may give a hint about the drug pharmacotherapeutic action

للمؤسسات داخل  
المستشفى

### 3. Commercial or trade or brand or proprietary name:

- This name is given by the specific pharmaceutical company synthesizing and marketing the drug.
- Examples: Diclofenac Na (Voltaren, Inflanban, Diclogesic)
- A single drug can have many brand names (this may be confusing) due to its manufacture and marketing by many pharmaceutical companies.

[●REC]

وصفان خارج الطبستھی

**Voltaren<sup>®</sup>**  
**Retard**  
Diclofenac Sodium  
**100 mg**

NOVARTIS  
Μη στεροειδής  
αντιφλεγμονώδης φάρμακο  
10 δισκία επικαλυμμένα με λεπτό υμένιο  
βροδείας αποδόσεως 100 mg

# DOSE FORMS OF DRUGS

- It is the physical form of drug product that is suitable for administration to man. It contains specified dose or amount of drug in a specified quantity or unit of the formulation.
  
- **Types of drug dose forms:**
  1. Oral
  2. Inhalational
  3. Parenteral
  4. Topical
  5. Suppository

**1. Oral dose forms:** It includes the following

- A. Pill: Tablets and capsules
- B. Liquid: Syrup or suspension
- C. Powder
- D. Herbal plants: seeds, leaves etc..
- E. Pastes



**2. Inhalational:**

[●REC]



الفرق  
Dose

- A. Aerosol
- B. Inhaler

**C. Vaporizer (Solutions)**

**3. Parenteral:**

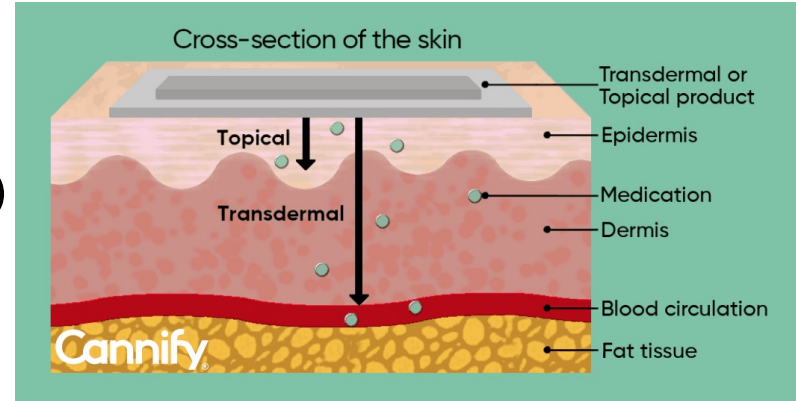
- A. Intradermal (ID)
- B. Intramuscular (IM)
- C. Intraperitoneal (IP)
- D. Intravenous (IV)
- E. Subcutaneous (SC)
- F. Intrathecal (IT)

SC

العمود  
التقري

## 4. Topical:

- A. Cream, gel, ointment, lotion
- B. Eye drops ( ophthalmic)
- C. Ear drops (otic)
- D. Skin patch (transdermal)



## 5. Suppository:

تاسیل

- A. Vaginal
- B. Rectal

فر من فاعلية 3 - دكتور صبح  
interal: any drug is taken  
into GIT  
oral, rectal, - - - -

THANKS