

DOCTOR 2020 | JU



PHARMACOLOGY

WRITER : ALI ALMAHROOK

CORRECTOR : Lana Khabbas

DOCTOR: Alia Shatnawi

Pharmacology:

- The science of drugs.
- It is the knowledge of history, source, physical and chemical properties, absorption, distribution, excretion, biotransformation, actions and therapeutic uses of drugs. (or toxic effects on microbes and cancer cells).
- When we talk about certain drugs we will mention how they were discovered.
- Many of the drugs that we use come from natural sources such as plants, bacteria and micro-organisms.
- Penicillin is an antibiotic that comes from fungi called *Penicillium* was discovered by Alexander Fleming.
- Antibiotic: one of the chemotherapeutic agent that is used to kill bacteria.
- Penicillin was discovered accidentally in 1928.
- The first patient was successfully treated by penicillin in 1942.
- Morphine one of the most powerful pain reducer (analgesic) comes from a tree called opium.

➤ What is Pharmacology?

➤ Pharmacology is the study of drugs

- It involves examining the interactions of chemical substances with living systems, with a view to understanding the properties of drugs and their actions, including the interactions between drug molecules and drug receptors and how these interactions elicit an effect.

Important definitions

- ❖ **Drug:** It is any chemical that affect living processes. It modifies an already existing function, and does not create a new function.
Important Note: drugs do not create a new function it only modifies the function.
- ❖ **Medical (or Clinical) Pharmacology:** Is the science that deals with the use of drugs for diagnosis, prevention and treatment of human disease.
- ❖ **Pharmacy:** Is that branch of the health sciences dealing with the preparation, dispensing, and proper utilization of drugs.
 - E.g. Panadol which has a scientific name called Paracetamol or Acetaminophen can be found in a tablet form or injection form or syrup form, so what makes these different forms is pharmaceutical science one branch of pharmacy.

- What's the difference between pharmacology and pharmacy?
 - Pharmacology deals with treating certain conditions, but pharmacy deals with preparing drugs.
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- ❖ **Toxicology:** Is that aspect of pharmacology which deals with adverse effects of drugs and the toxic effects produced by household, environmental and industrial chemicals.
 - **Adverse effect:** unwanted effect that came from the drug but its usually predictable and it happens commonly.
 - **E.g. most people when they take brufen they face irritation in the stomach so by studying toxicology we prevent this effect.**

 - ❖ **Clinical Toxicology:** Is the study of the toxic or adverse effects of toxins on the human body, including the diagnosis and treatment of human poisoning.

 - ❖ **Analytical toxicology:** Is a branch of analytical chemistry concerned with the measurement of toxic chemicals in biological and environmental materials.

 - ❖ **Forensic Toxicology:** Deals with the medico-legal aspects of toxicity. It is concerned with proving the relationship of the health condition of the patient (including death) with a particular poison.

❖ **Environmental toxicology:**

- Deals with the movement of toxins into the environment and contamination of food chain.
 - Industrial toxicology is a specific area of environmental toxicology that deals with the work environment which is part of industrial hygiene.
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- **Two general principles that every student should always remember:**
 - **1. All substances can under certain conditions be toxic.**
 - E.g. Paracetamol is considered a safe drug with almost no side effects, but an over dose from paracetamol will make it toxic.
 - E.g. A certain dose could be toxic for patient with 70 years but not toxic for patient in 20 because the drug works in different way depending on a certain condition (the condition here is the age).
 - E.g. patient has a liver disease so I shouldn't give him a drug that is metabolized in liver.
 - (Use the proper drug for the proper condition for the patient).

 - **2. All dietary supplements and all substances promoted as health-enhancing should meet the same standards of efficacy and safety as drugs.**
 - Even if the substance comes from natural source that doesn't mean it's safe, because it is a chemical substance that will interact with the body so it's considered as a drug and need to be careful with it.

- ❖ **Prescription: the written direction for the preparation and the administration of the drug.**
 - **We write the: -**
 - **Scientific name of the drug**
 - **The dose**
 - **How many times per day?**
 - **Route of the drug (e.g. pills or injections)**

- ❖ **The therapeutic effect: is the primary effect intended that is the reason the drug is prescribed such as morphine sulfate is analgesia.**

- ❖ **Side effect: secondary effect of the drug (the one that is unintended), side effects are usually predictable and may be either harmless**
 - **Most of the time side effects are not harmful.**

- ❖ **Drug toxicity: deleterious effect of the drug on an organism or tissue, result from overdose.**

- ❖ **Drug interaction: occur when administration of one drug before or after alter effect of one or both drug.**
 - **Some drugs can be toxic when it interacts with another drugs.**

