

PHARMACEUTICS -1 (BP 103 T)

UNIT: 1

CLASS: 9

TOPIC: POSOLOGY

- Definition
- Factors effecting posology

Definition

- The word “posology” is derived from the Greek words “posos,” Meaning “how much,” and “logos,” meaning “study” or “discourse.” Therefore, posology literally means “the study of how Much” and refers to the science of determining the appropriate Dosages of medications

Several factors affect posology in pharmaceuticals, including:

- 1.Age
2. Body Weight and Surface Area
3. Sex
4. Genetics
5. Health Status
6. Drug Interactions
7. Tolerance and Resistance

8. Route of Administration

9. Idiosyncrasy

10. Synergism

11. Tachyphylaxis

12. Hypersensitivity

13. Antagonism

14. Addiction

15. Habituation

• **Age:** Children and elderly patients often require different dosages due to differences in metabolism and organ function. For example, pediatric doses of antibiotics like Amoxicillin are often calculated based on body weight.

• **Body Weight and Surface Area:** Dosages are sometimes adjusted based on a Patient's body weight or body surface area to ensure the medication is effective Without being toxic. Chemotherapy drugs, such as doxorubicin, are often dosed Based on body surface area

• **Sex:** Male and female patients may metabolize drugs differently Due to hormonal differences. For instance, certain drugs like Zolpidem (a sleep aid) recommended at lower doses for Women.

• **Genetics:** Genetic variations can affect how individuals metabolize Drugs. For example, individuals with specific genetic variations Might metabolize warfarin, a blood thinner, more slowly or quickly, Affecting the dose needed

•**Health Status:** Conditions such as liver or kidney disease can Affect drug metabolism and excretion, requiring dose Adjustments. For example, patients with renal impairment often Need lower doses of drugs like gentamicin to avoid toxicity.

•**Drug Interactions:** The presence of other medications can affect The metabolism of a drug, necessitating dose adjustments. For Instance, rifampicin induces liver enzymes that can decrease the Effectiveness of oral contraceptives

•**Tolerance and Resistance:** Some patients may develop tolerance To certain medications, requiring higher doses to achieve the Same effect. This is common with opioid pain medications like Morphine.

•**Route of Administration:** The route through which a drug is Administered (oral, intravenous, intramuscular, etc.) can affect the Dosage. For example, oral doses of morphine are typically higher Than intravenous doses due to first-pass metabolism in the liver.

•**Idiosyncrasy** in posology refers to an unusual or abnormal reaction to a Drug that is unique to an individual, often due to genetic factors. These Reactions are not related to the dose or known pharmacological action of the drug and can occur even at standard therapeutic doses.

Example:

A well-known example of idiosyncratic reaction is with the drug Sulfonamides, which are antibiotics. While most patients tolerate these Drugs well, some individuals may experience severe allergic reactions, Such as Stevens-Johnson syndrome, which is a rare but life-threatening Condition. This idiosyncratic reaction is unpredictable and can occur Even when the drug is used at recommended doses.

•**Synergism** in posology refers to the phenomenon where the combined Effect of two or more drugs is greater than the sum of their individual Effects. This can enhance therapeutic outcomes or reduce the required Dose of each drug, potentially minimizing side effects.

- **Example:**

- A common example of synergism is the combination of Sulfathiazole and trimethoprim in the antibiotic formulation known As co-trimoxazole. Individually, sulfamethoxazole and trimethoprim are Bacteriostatic, meaning they inhibit the growth of bacteria. However, When combined, they exhibit a bactericidal effect, effectively killing the Bacteria. This synergistic combination is more effective in treating Bacterial infections like urinary tract infections and certain types of Pneumonia than either drug alone.

“**Tachyphylaxis**” refers to a rapidly diminishing response to successive doses of a drug, rendering it less effective. In posology (the study of how medicines are dosed), tachyphylaxis indicates that the effectiveness of a drug decreases with repeated administration over a short period, often requiring adjustments in dosing or drug regimen to maintain efficacy.

Hypersensitivity refers to an exaggerated or inappropriate immune response to a drug. This can manifest as allergic reactions, ranging from mild (such as rashes or itching) to severe (such as anaphylaxis). Hypersensitivity can necessitate discontinuation of the offending drug and careful monitoring or adjustment of treatment regimens.

“**Antagonism**” refers to the interaction between two or more drugs that leads to a reduced effect of one or all of the drugs involved. This can occur when one drug interferes with the action of another, either by competing for the same receptor sites or by affecting the metabolic pathways of the other drug. As a result, the intended therapeutic effect is diminished, which may require dose adjustments or alternative treatments to achieve the desired outcome.

“**Addiction**” refers to a chronic, relapsing disorder characterized by compulsive drug seeking and use despite harmful consequences. It involves a physical and psychological dependence on a substance, leading to tolerance (requiring higher doses to achieve the same effect) and withdrawal symptoms when the drug is not taken. Addiction impacts how drugs are prescribed and monitored, often requiring careful management, alternative therapies, and support systems to prevent misuse and manage dependence.

“Habituation” refers to a condition in which a person becomes accustomed to a drug or its effects over time, leading to a decreased response to the drug. Unlike addiction, habituation does not involve a compulsive need to use the drug or withdrawal symptoms when the drug is discontinued. Habituation can necessitate dose adjustments or changes in treatment to maintain effectiveness.