

Drug Interactions

Antagonists: Drugs that bind to and inhibit the activity of one or more receptors in the body. Antagonists are also called inhibitors. When the drug inhibits receptor(s) response in the body by binding to it.

Agonists: Drugs that bind to and stimulate the activity of one or more receptors in the body. When the drug stimulate the receptor(s) activity by binding to it.

Partial Agonists: When the drug's binding to a receptor causes the receptor's response to diminish

Four Stages of Drugs

Absorption: occurs as a medication enters the bloodstream and begins to cause an effect within the body

Food, medications, route of administration, and health status also alter the rate of absorption.

Distribution: After absorption, medication is distributed to various locations in the body via bloodstream

Drug's chemical formulation/preparation, use, and ability to bind/penetrate tissues or proteins are factors in distribution.

Metabolism/Biotransformation: occurs after the drug has reached its site of action... undergoes a chemical alteration within the body, where medications are broken down.

metabolism of drugs happens in the liver, muscle, lungs, kidney, plasma, and intestinal mucosa. Factors that play a role in metabolism are the drug's chemical composition.

Excretion: the elimination of the drug from the body system.

GI tract and kidneys are responsible for elimination. Factors are liver or kidney diseases and medications.

Drug Drug Interactions

Additive effect: Drug interactions in which the effect of a combination of two or more drugs with similar actions, administered at the same time, is the action of one plus the action of the other, with the total effect of both drugs being given

Synergistic effect: Drug interactions in which the effect of a combination of two or more drugs with similar actions is greater than the sum of the individual effects of the same drugs given alone (compare with additive effects)

Effects of Medications

Adverse effect: A general term for any undesirable effects that are a direct response to one or more drugs

Therapeutic effect: The desired or intended effect of a particular medication.

Nephrotoxicity: When a drug or toxin results in kidney damage, ultimately leading to difficulty excreting drugs and other wastes. A common way to recognize this is an increase in electrolyte levels.

Allergic reaction: When the immune system develops a sensitivity to one or more allergens (ex.a benign foreign substances, such as peanuts) and causes an immunoresponse in reaction to coming in contact with the allergen. Depending on the person, this response can be mild or extremely dangerous.

Adverse Reactions

Side Effects: the adverse/undesired effect of a drug in the body.

Toxic Effects: The condition of producing adverse bodily effects due to poisonous qualities.

Allergy: An immunologic hypersensitivity reaction resulting from the unusual sensitivity of a patient to a particular medication; a type of adverse drug event

Cumulation: Drugs which are slowly excreted from the body may build up overtime and raise toxicity levels or cause adverse effects.

Drug Interaction: Alteration of the pharmacological or pharmacokinetic activity of a given drug caused by the presence of one or more additional drugs; it is usually related to effects on the enzymes required for metabolism of the involved drugs

Tolerance: Reduced response to a drug after prolonged use

Dependence: A state in which there is a compulsive or chronic need, as for a drug

Factors Affecting Drug Interaction

Age: The elderly are more likely to have chronic conditions and disease which may directly effect the drug's action, or be taking multiple drugs to treat various conditions which may have adverse interactions on each other.

Body Mass: Being overweight can cause fat-soluble drugs to be distributed in the body for an extended period of time and increase the effects of these drugs.

Factors Affecting Drug Interaction (cont)

Gender: Different sexes may metabolize some drugs differently, and the therapeutic and adverse effects can express differently. For example, some drugs like cimetidine can cause feminization in males.

Environment: A person who is exposed to poverty and a poor, abusive, or discriminatory social environment may be more susceptible to developing a drug addiction. Other factors, such as air and water quality, can also cause disease which can play a role in how a drug goes through the 4 stages in a body.

Route of Administration: Different ROA have different ways the drug is absorbed and can result in a different effect on the body. Ex. First Pass Effect can be avoided if a drug is given intravenously as opposed orally.

Pathologic State: A person's disease can influence the way a drug goes through the 4 stages in the body; For example, someone who has a disease that compromises kidney function may have difficulty excreting the drug from their body

Psychological: People who have a mental disorder or illness are more susceptible to drug abuse, either taking more than needed, or missing dosages and non adherence, depending on the condition. The therapeutic and adverse effects of a psychological drug may express differently depending on the development of an individual.

Time of Administration: Missed dosages could make the effects of a drug not maintain their therapeutic effect, while taking a dose too early can put a person at more risk of the adverse effects of the drug expressing.

Other Definitions

First Pass Effect: Missed dosages could make the effects of a drug not maintain their therapeutic effect, while taking a dose too early can put a person at more risk of the adverse effects of the drug expressing.

Loading Dose: initial higher dose of a drug that may be given at the beginning of a course of treatment before dropping down to a lower maintenance dose.

Maintenance Dose: the amount of a medication administered to maintain a desired level of the medication in the blood.

NOTES