METABOLISM INTERACTIONS:

Are those where the metabolism of the object drug is altered.

Mechanisms of metabolism interactions include:

1.Enzyme induction:

Increased rate of metabolism.

2.Enzyme inhibition:

Decreased rate of metabolism. It is the most significant interaction in comparison to other interactions and can be fatal.

METABOLISM INTERACTIONS

1.ENZYNE INDUCTION		
CORTICOSTEROIDS, ORAL CONTRACEPTIVES, COUMARINS, PHENYTOIN	BARBITURATES	DECREASED PLASMA LEVELS; DECREASED EFFICASY OF OBJECT DRUGS
ORAL CONTRACEPTIVES, ORAL HYPOGLYCAEMICS	RIFAMICIN	DECREASED PLASMA LEVELS
2.ENZYME INHIBITION		
TYRAMINE RICH FOOD	MAO INHIBITORS	ENHANCED ABSORPTION OF UN METABOLISED TYRAMINE.
COUMARINS	METRANIDAZOLE PHENYL BUTAZONE	INCREASED ANTI COAGULANT ACTIVITY.
ALCOHOL	DISULPHIRAM, METRONIDAZOLE	INCREASED IN PLASMA ACETALDEHYDE LEVELS

EXCRETION INTERACTIONS

Are these where the excretion pattern of the object drug is altered. Major mechanisms of excretion interactions are-

- Alteration in renal blood flow
- Alteration of urine PH
- Competition for active secretions
- Forced diuresis

EXCRETION INTERACTIONS

1.CHANGES IN ACTIVE TUBULAR SECRETION		
PENCILLIN,CEPHALOSPORINS,NALIDIXIC ACID	PROBENICID	ELEVATED PLASMA LEVELS OF ACIDIC DRUGS
2.CHANGES IN URINE PH		
AMPHETAMINE	ANTACIDS,THIAZIDESACETAZOLAMIDE	INCREASED PASSIVE REABSORPTION OF BASIC DRUGS.INCRESED RISK Of TOXICITY
3.CHANGES IN RENAL BLOOD FLOW		
LITHIUM BICARBONATE	NSAIDS	DECREASED RENAL CLEARANCEOF LITHIUM.RISK OF TOXICITY

Pharmacodynamic interactions:

Are those in which the activity of the object drug at its site of action is altered by the precipitant. Such interactions may be direct or indirect.

1.These are of two types1.direct pharmacodynamic interactions.

2.Indirect pharmacodynamic interactions.

DIRECT PHARMACODYNAMIC INTERACTIONS:

In which drugs having similar or opposing pharmacological effects are used concurrently.

The three consequences of direct interactions are

1.Antagonism.

2.Addition or summation.

3.Synergism or potentiation.

Antagonism:

The interacting drugs have opposing actions

Example: Acetylcholine and noradrenaline have opposing effects on heart rate.

Addition or summation:

The interacting drugs have similar actions and the resultant effect is the some of individual drug responses

Example:CNS depressants like sedatives and hypnotics,...etc

Synergism or potentiation:

It is an enhancement of action of one drug by another

Example: Alcohol enhances the analgesics activity of aspirin.

Indirect pharmacodynamic interaction:

In which both the object and the precipitant drugs have unrelated effects.but the latter in Some way alerts the effects but latter in some way alerts the effectsof the former.

Example: salicylatesdecrease the ability of the platelets to aggregate thus impairing the Homeostasis if warfarin indused bleeding occurs.

CONSEQUENCES OF DRUG INTERACTIONS:

The consequences of drug interactions may be:

- *Major: Life threatening.*
- *Moderate: Deteriotion of patients status.*
- *Minor: Little effect.*

REDUSING THE RISK OF DRUG INTERACTIONS:

1.Identify the patients risk factors.

2.Take through drug history.

3.Be knowledge about the actions of the drugs being used.

4.Consider therapeutic alternatives.

5Avoid complex therapeutic regiments when possible.

6.Educate the patient.

7.Monitor therapy.

INFLUENCE OF SMOKING ON DRUG INTERACTIONS:

Smoking increases the activity of drug metabolizing enzymes in the liver, With the result that certain therapeutic agents.

Example: Diazepam, propoxyphene, theophylline, olanzapine.

Are metabolized more rapidly,and their effect is decreased.

INFLUENCE OF ALCOHOL ON DRUG INTERACTION:

Chronic use of alcohol beverages may increases the rate of metabolism of drugs such as warfarin and phenytoin, probably by increasing the activity of hepatic enzymes.

- *Acute use of alcohol by non alcoholic individuals may cause an inhibition of hepatic enzymes.*

- *Use of alcoholic beverages with sedatives and other depressants drugs could result in an excessive depressant response.*

INFLUENCE OF FOOD ON DRUG INTERACTION:

Food effects the rate and extent of absorption of drugs from the GI tract.

Example: Many anti biotics should be given atleast 1hr before or 2hr after meals to achieve Optimal absorption.

- *The type of food may be important with regard to the absorption of concurrently administered Drugs.*

Example: Dietary items such as milk and other dairy products that contain calcium may decrease .

The absorption of tetracycline and flouroquinolone derivatives.

- *Diet also may influence urinary pH values.*