

## Biotransformation (Metabolism):

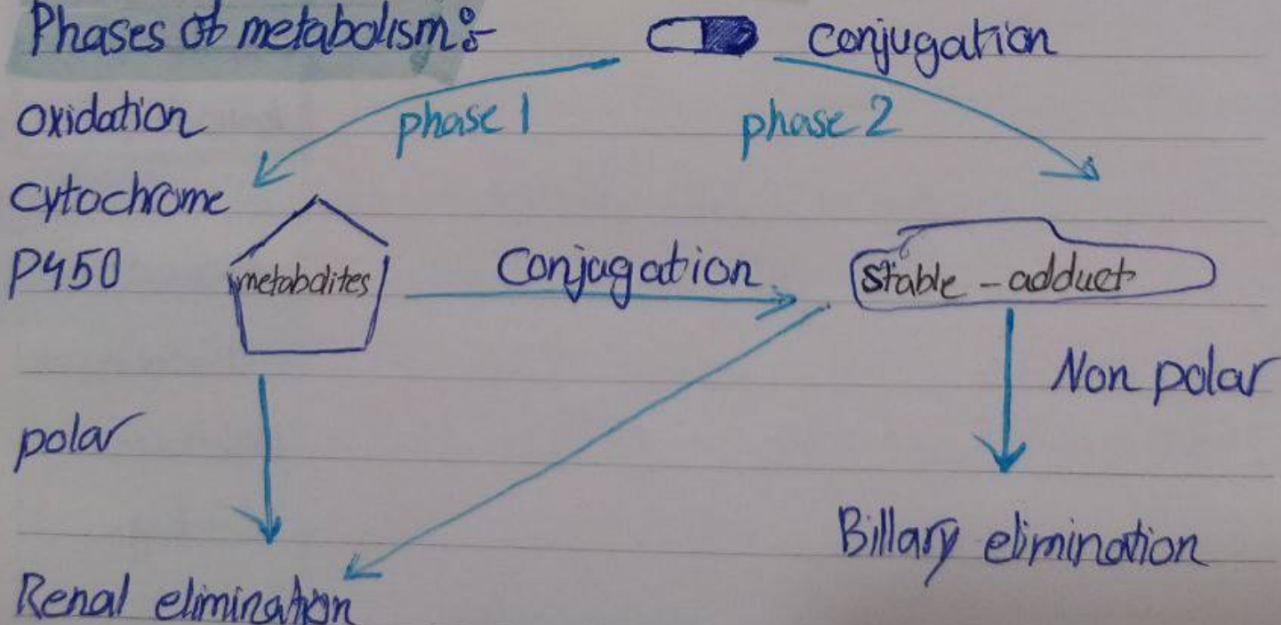
Unionized drug  $\xrightarrow{\text{convert}}$  ionized (water soluble)

Main site of metabolism is liver

### Consequences of drug metabolism:

- ① Active  $\Rightarrow$  Inactive metabolite
- ② Inactive Prodrug  $\Rightarrow$  Active drug  
enalapril  $\rightarrow$  enalaprilat
- ③ Active drug  $\Rightarrow$  Active metabolite  
codeine  $\rightarrow$  Morphine
- ④ Drug  $\Rightarrow$  toxic metabolite  
Halothane + Paracetamol  $\rightarrow$  hepatotoxic

### Phases of metabolism:



## Factors affecting Biotransformation :-

- 1- physiological factors
- 2- pathological factors
- 3- pharmacogenetic variation in metabolizing enzymes
- 4- Enzyme induction + Enzyme inhibition

enzyme induction drugs :-  $\uparrow$  rate of hepatic metabolism

▶ inducer drugs: "Peanut Butter Never Really Craves Caffeine"

Phenobarbitone  $\rightsquigarrow$  tolerance

Phenytoin

Nicotine — this is why smoking cause enzyme induction

Rifampicin — enhance warfarin metabolism

Carbamazepine

prolonged use of enzyme inducer drugs may cause

→ in children — RICKETS

→ in adults — Osteomalacia

enzyme inhibitor drugs :-  $\downarrow$  rate of metabolism of other drugs

▶ inhibitor drugs: "Erythromycin Clarifies Cimetidine's

Contraceptive Power"

Erythromycin

Clarithromycin

Cimetidine

Contraceptive