Lec 7

Ficks law

$$C_1 - C_2 \left[\frac{\text{Area} * \text{permeability}}{\text{Thickness}} \right]$$

Handerson Equation

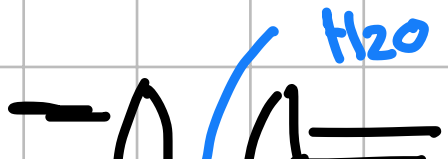
$$\log \frac{\text{pro}}{\text{unpro}} = \text{PKa} - \text{PH}$$

weak acid are excrected in Alkaline urine → $NaHCO_3$

weak basis → ascrobic acid , NH_4Cl
↳ vitamin (C)

→ selective
→ saturable
→ inhibitable
special carriers

Lec 8



Aqueous diffusion

ABC → p-glycoprotein MDR1

MRP → urine bile

SLC don't bind ATP directly

"تَاجُ الذِّكْرِ"

لَا إِلَهَ إِلَّا اللَّهُ وَحْدَهُ لَا شَرِيكَ لَهُ

لَهُ الْمُلْكُ وَلَهُ الْحَمْدُ وَهُوَ عَلَى كُلِّ شَيْءٍ قَدِيرٌ

Endocytosis and Exocytosis

iron → into RBCs

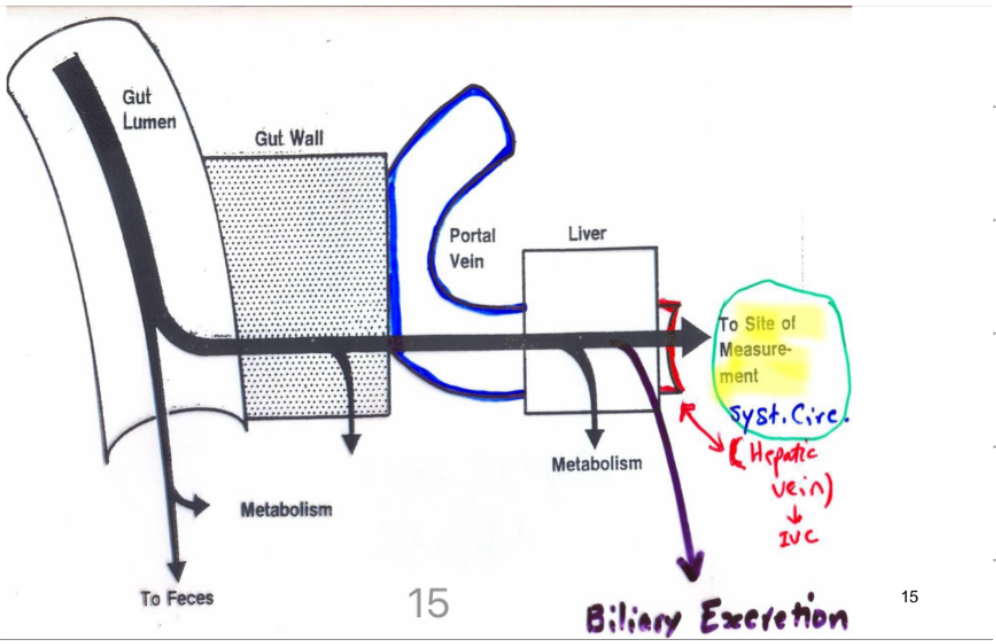
vit B12 → wall of the gut

First pass Effect

First-Pass Effect

- Drugs absorbed from the GIT must pass through the gut wall and portal vein to the liver before reaching the systemic circulation.
- The drug may be metabolized in the gut wall, portal vein, and the liver prior to entry to the systemic circulation.
- Or, it may get excreted by the liver through bile.

12



15

IV → 100%

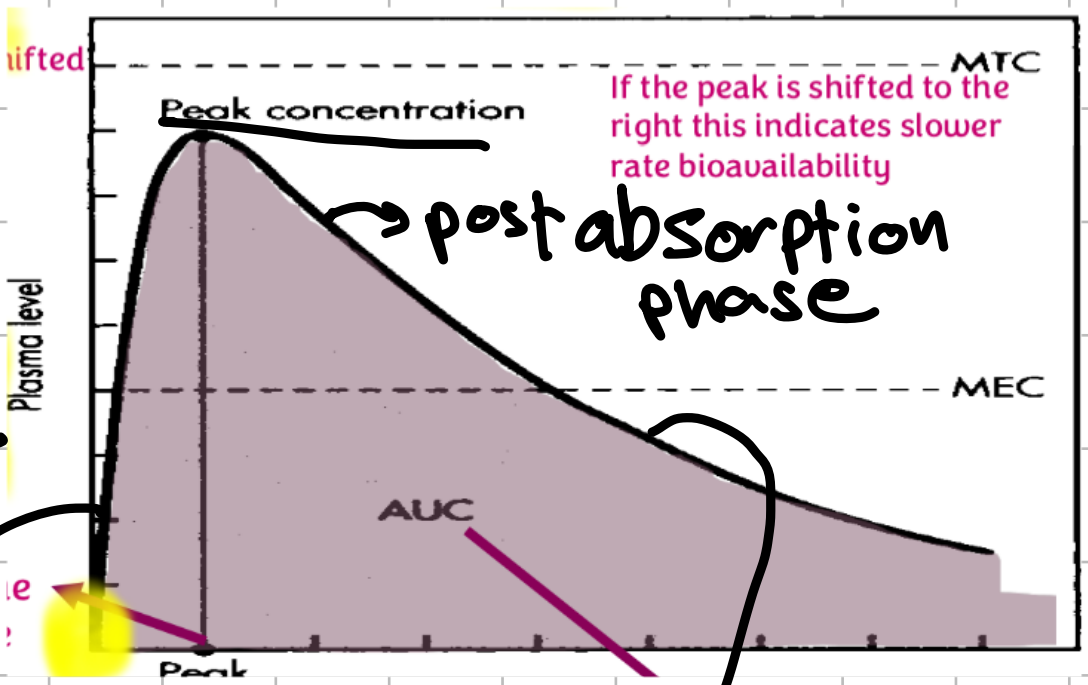
orally < 100%

Bioavailability

it is the fraction of the unchanged active drug reaching the system circulation.

IV = 100% orally < 1

the area under blood conc versus time curve



Absorption phase

Elimination phase

* P-glycoprotein ↓ Bioavailabi so we use grapefruit juice (Inhibition of the reverse transporter) → ↑ Bioavai

* Effect of first pass on bioavailability :-

$F = 1 - ER$ → Elimination Rate

- **Drugs with high extraction ratio exhibit interindividual differences in bioavailability and drug concentration, because of differences among individuals in hepatic blood flow and hepatic drug metabolism.**

Lec 9

Bioequivalence

Compare different formulations of the same active drug

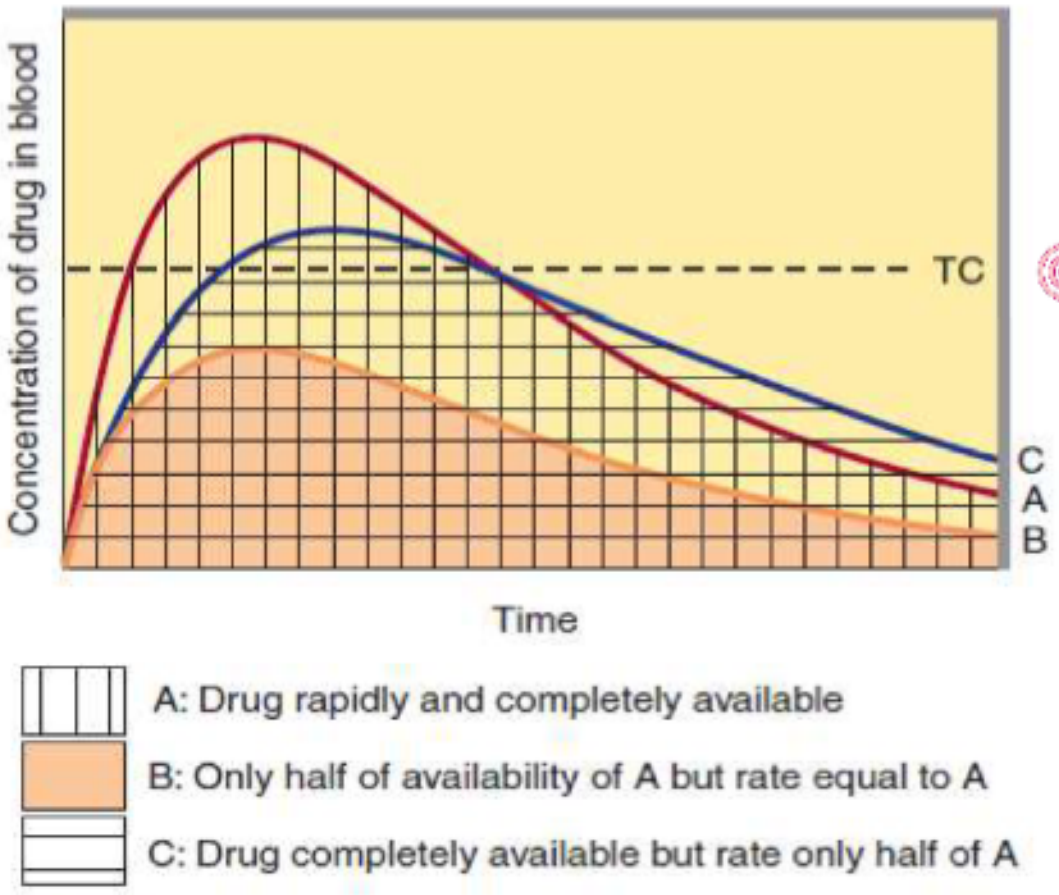
بقارن من حيث:-

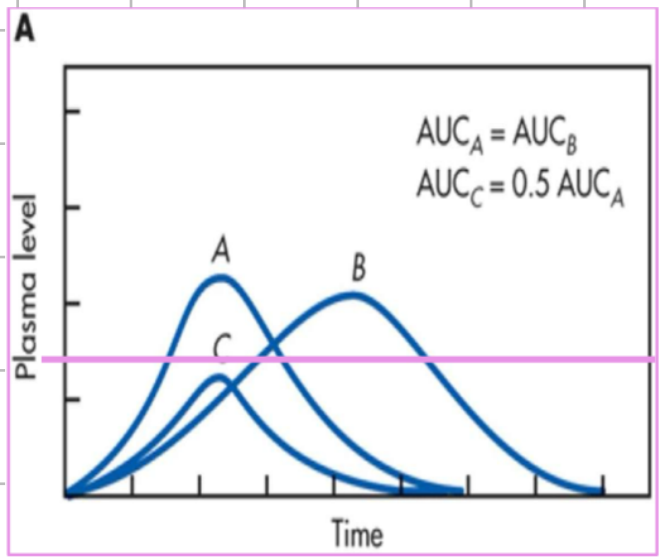
Cmax

Tmax

AUC

Lag time is the delay that occurs because the drug needs time for disintegration, dissolution, and absorption before reaching the systemic circulation at a concentration sufficient to achieve the target concentration. This lag time can be short (10–15 minutes) or long (1–1.5 hours).



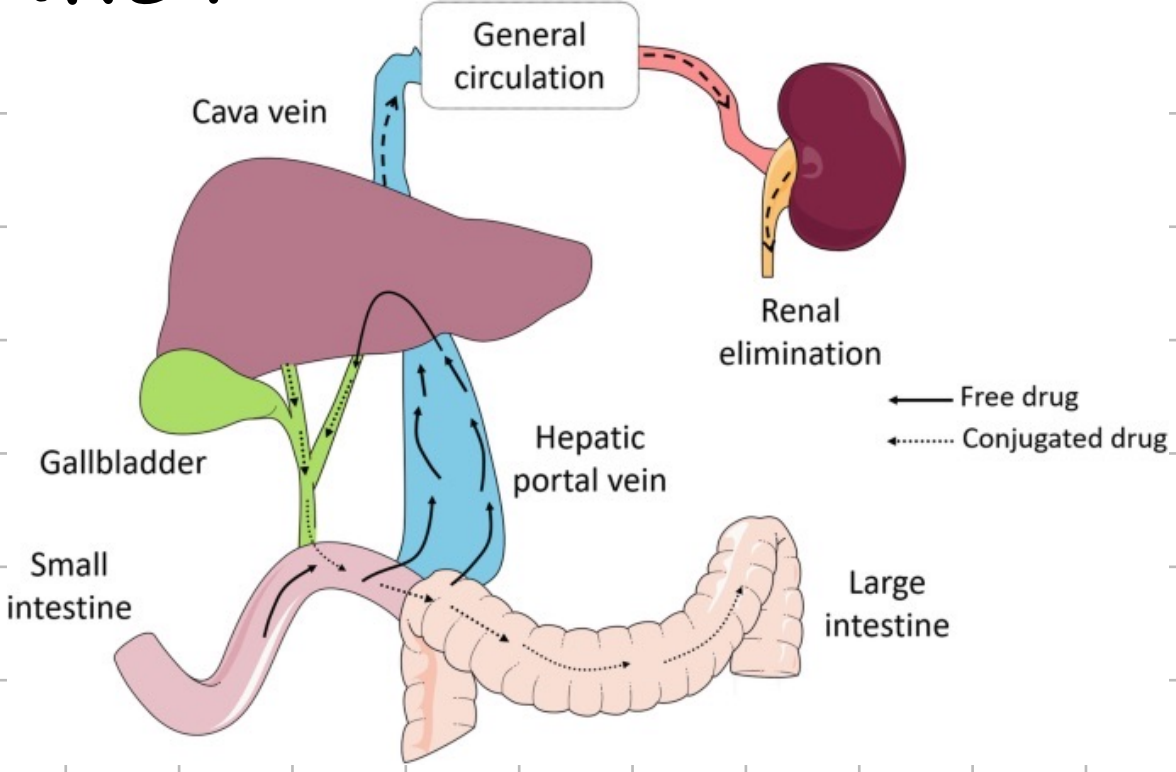


the drug reach the same Cmax but at longer Tmax we call it

late bioavailability

Enterohepatic cycling

* it reduces drug bioavailability and prolongs its half life or elimination.



- **Activated charcoal can adsorb many drugs and chemicals (except ionized ones, and petroleum distillates) into its surface.**