pharmacology lec3

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Pharmacokinetics

- Definition: What the body does to the drug
- Absorption
- Distribution
- Metabolism
- Excretion

Drug Absorption:
- Passage of drug from administration site to systemic circulation

- Mechanisms:

1. Passive diffusion; No energy needed and with concentration gradient.
(lipid soluble drugs/water soluble drugs across the aqueous channels)
2. Facilitated diffusion; by carrier or transporter.
No energy is required and according to the concentration gradient
3. Active transport
-Energy is required
-may be against the concentration gradient by drug carrier or transporter.
4. Endocytosis; for high molecular weight

Factors Affecting Absorption:
- Patient-related:
  - Route of administration
I.V. and inhalation > I.M. > S.C. > Oral >Topical
  - Absorbing surface
  - Systemic circulation
  - Specific factors

- Drug-related:
  - Water and lipid solubility
  - Pharmaceutical preparation
  - Ionization of the drug
Non-ionized (uncharged) → better absorption.

pH and Drug Absorption:

- Non-ionized forms absorb better
- Weak acids absorb more in acidic media
- Weak bases absorb more in alkaline media
-At low pH weak acids become unionized while the weak bases become ionized.
-At high pH weak base drugs become unionized while weak acids become ionized.

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Bioavailability:

- Percentage of drug reaching systemic circulation
- Affected by extent of absorption and first-pass metabolism [factors]

First-pass Effect:
- Metabolism in gut wall (Estrogens), liver (Nitroglycerin and propranolol), or lungs (nicotine) before reaching systemic circulation