PHARMACOKINETICS: Absorption (p.1)

Intro.: “fully absorbed” drug
  Crossing cell membranes (to reach RSs) through walls of the GI tract (PO route)
  Through capillary walls (endothelial cells)
  Past the blood-brain-barrier (BBB) (endothelial cells + astrocytes)
  Or placental barrier
  Miscel. Lungs, rectum, nasal mucosa, etc.

1. The body’s capillary walls
   endothelial cells, pores 40 to 90-150 angstrom units wide
   blood proteins (e.g. albumin)
   protein binding, a “protein” bound drug

2. Cell membranes
   double layer of phospholipids molecules
   hydrophobic, hydrophilic
   lipophilic
   protein molecules embedded in/piercing through membrane
     structural, enzymes, pores, receptor sites (RSs)
   semipermeable, molecule size & charge (valence)
     filtration, passive diffusion, active transport

3. The BBB
   brain’s capillary walls
   endothelial cells with “tight junctions”

4. The placental barrier
   teratogens

5. Factors Affecting Absorption
a. **Solubility** (in water or oil medium)

b. **Ionization** (ionized vs. non-ionized forms)

c. **Polarity**

d. **pH** (acid 0 --- neutral 7 --- base/alkaline 14)
   - stomach acid – 1.2 pH, small intestine – 2.0,
   - large intestine – 6.6, urine – 4.5 – 8.0, blood – 7.4
   - most drugs – 5 to 9

   acidic drug in alkaline medium --- ionize
   acidic drug in acidic medium --- do not ionize
   alkaline drug in alkaline medium --- do not ionize
   alkaline drug in acidic medium --- ionize

  **e. “ion trapping”**
  - morphine 8.0, dopamine 9.0, amphetamines 10.0