Formulation Factors

Objectives

- Understand formulation factors which affect oral absorption
  - In general fastest absorption from:
    - Solution > suspension > capsule > tablet > coated tablet
  - E.g. for pentobarb
    - Solution > suspension = capsule > tablet

Formulations

- Solutions
- Suspensions
- Capsules
- Tablets

Solutions

- Common dosage form
  - Easily adjust dose
- Usually rapid and complete absorption
- Gastric emptying may be limited factor
- Acidic drugs given as salt may precipitate in stomach - fine suspension should redissolve
- Mixed solvent - water/alcohol/glycerol (altered dielectric)
  - Emulsion or soft gelatin capsule

Suspensions

- Particle size down- increase absorption
- Dispersion of fine particles aided by surface active agent
- Aging of suspension - solution/precipitation - leading to larger less soluble particles
  - Solubility function of particle size

Capsules

- Gelatin shell should disrupt quickly
- Dispersing agent should aid solution
- Tightly packed capsule may have reduced absorption

Tablets

- Ingredients
  - Drug - may be poorly soluble
  - Lubricant - usually hydrophobic
  - Granulating agent - holds particles together
  - Filler - drug interaction (possible)
  - Wetting agent - helps penetration of water
  - Disintegrating agent - breaks up the tablet
  - Coating, enteric coating - may reduce absorption

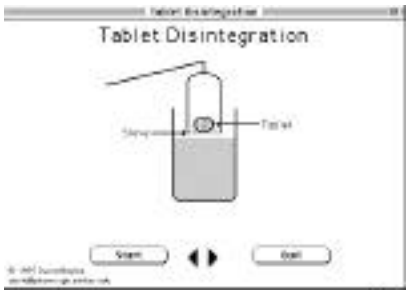
Sustained Release Tablets

- Benefits - sustained blood levels, reduce variability in Cp, reduced side effects (?)
- More complicated, larger doses, more expensive
- Types
  - Erosion, waxy matrix, coated pellets, coated ion exchange, osmotic pump

In vitro testing

- Disintegration testing
  - Tablet break into granules
- Dissolution testing
  - Tablet breaks up and drug goes into solution
  - Factors include dissolution medium, agitation, temperature and apparatus
  - Quality control between batches
  - *In vitro / in vivo* correlation

Disintegration Testing



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