475 <u>**ROUTES OF DRUG ADMINISTRATION**</u>

To be effective in altering behavior/how the body works, the drug molecules must first **get into the body**; and once inside the body, must then **get to the specific receptor sites**/drug target receptors (site of action).

General factors to consider:
    Chemical properties of the drug (e.g. pH, fat/H2O soluble)
    Proper medium to carry drug (esp. oil vs. H2O)
    Desired latency of drug onset
    Desired duration of drug effects
    User variables: age, sex, race, weight (esp. fat tissue vs. muscle)
    Specific medical conditions of user (e.g. conscious vs. unconscious,
        factors related to GI tract, liver, kidney; can S swallow?)
    Other: cost, pain, ease of delivery

Drug forms & preparations:
    Solids – tablets, crystals, powders, capsules, suppositories, patches
    Liquids – in oil, in H2O
        Suspensions – in oily creams (injectable, ointmens)
    Inhalants – gases, smokes, vapors

Drug "vehicle" – inert substance/fluid drug is in

Body "compartments"
    Body is essentially a set of "walled compartments" (separated by various
        membranes or cell walls)
    e.g. GI tract, inside of blood vessels (bloodstream), extracellular fluids,
        inside/outside of BBB, fat cells
    So, once the drug enters the body, it still has to pass through various cell
        membranes in order to reach the targeted receptor sites

1. **<u>Oral (non-parental route)</u>**
   Latin abbreviation is "P.O." (*per os*, through the mouth)
   A long drug route, drug passes through many cell membranes on its way to RSs

   Most common route
   Absorption of drug through walls of GI tract & into blood vessels

   Absorption is highly variable
   Food/no food in GI tract & what sort of food
   GI motility
   Actual composition of drug
   GI tract enzymes

   Usually a **slower absorption route**
   Advantages

   Disadvantages

   Relatively **easy route** to use

   Drawbacks of oral route

   "First pass effect" & liver
   blood supply to liver

   liver enzymes, biotransform = metabolize drug

   drug "metabolites"

   necessitates a larger initial drug amount

   between S variance in which/how much liver enzyme S has

2. **<u>Injection (parental route)</u>**
   Can avoid problems inherent in using oral route

   Advantages

   Disadvantages

   Difference kinds of injections:
   a. **Intravenous** (I.V.)

   b. **Intramuscular** (I.M.)

   c. **Subcutaneous** (S.C. or subcu)

   d. **Intraperitoneal** (I.P.)

   e. **Intra-arterial** (I.A.)

   f. **Intrathecal** (I.T.)
      Often submeningeal
   g. **Intracranial** (I.C.)

3. **<u>Inhalation</u>**
    gases, vapors
    absorbed into blood vessels that serve the lungs
    fastest route

    Disadvantages

4. **<u>Other Routes</u>** of Administration
    Via mucous membranes
        Sublingual
        Via conjunctivum
        Via rectum
        Via vaginal walls
        Via nasal mucosa

    Topical/Transdermal Absorption
        Ointmens, creams, dermal patches
        Methods to enhance skin penetration (ultrasound, electric current)
        Case of accidental poisoning with organophosphates

    Depot Preparations
        e.g. Norplant

    Peritoneal Pumps

    Liposomes, Microspheres