Routes of Drug Administration	**Oral** **Topical (Percutaneous)** **Rectal or Vaginal** **Pulmonal** **Parenteral**
Types of Orally Administered Drugs	**Pills (single dose)** **Tablets** **Coated Tablets (shell)** **Matrix Tablets (carrier meshwork)** **Capsules (gelatin shell)** **Troches/Lozenges** **Solutions**
Percutaneous Drug Administration	**Ointment + Lipophilic cream** **Paste** **Lotion** **Gels** **Can be single or multilayer, or contained in a reservoir**
Other Topicals	**Eye Drops** **Nose Drops** **Pulmonary Formulations** **Suppositories**
Parenteral Drug Administration	**Ampules** **Vials** **Cartridge Ampules** **Infusions** **Advantage: 100% Absorption, enters circulation without hepatic elim, better bioavailability of hydrophilic drugs**

Types of Barriers for Drug Distribution/Absorption	**External Absorption Barriers: (epithelial layer on skin, lung, intestine—Lipophilic barrier) Internal Blood-Tissue Barriers: Cardiac muscle, endocrine glands, gut, liver, CNS**
Drug Distribution	**Passive Diffusion Active Transport Receptor-mediated Endocytosis [DRUG] IS A FUNCTION OF ABSORBTION AND ELIMINATION!**
Bioavailability	**The AUC of the administered drug divided by the AUC of the intraveneously administered drug IV>TD>IM=SC>Rectal>Oral=Inhal**
Volume of Distribution Rate of Elimination	**Vd=Amt of drug in the mody/[drug] R of E: Via kidney (filtration) or liver (metabolism) Usually first order kinetics 3 drugs have zero-order kinetics**
Clearance	**Rate of Elim/[Drug] Rate of Elim= k*Cp*Vd K= ln2/T ½ CL= K*Vd**

Phase I Reactions	**Convert parent compound into more polar metabolite Add/unmask functional group: OH, SH, NH2, COOH, etc Oxidation, Reduction, hydrolytic cleavage, Alkylation, Dealkylation, etc…**
Phase II Reactions	**Conjugation with endogenous substrate (increase aq solubility) Conjugation with gucoronide, sulfate, acetate, amino acid**
MFO Mixed Function Oxidases	**Require reducing agent and molecular oxygen Two enzymes: 1) Flavoprotein, NADPH-cytochrome c reductase 2) Cytochrome P450 (electron acceptor); CYP**
P450 Enzymes	**PPAR ligands, CYP1, CYP2E, CYP2B Polymorphisms cause changes in drug metab: CYP2C19, CYP2B, CYP2D6 Induction of P450 enzymes=metabolize drug**
Conjugation Reactions	**Glucoronidation Sulfation Acetylation Amino acid Conj Glutathione Conj Fatty acid Conj Condensation Reaction**