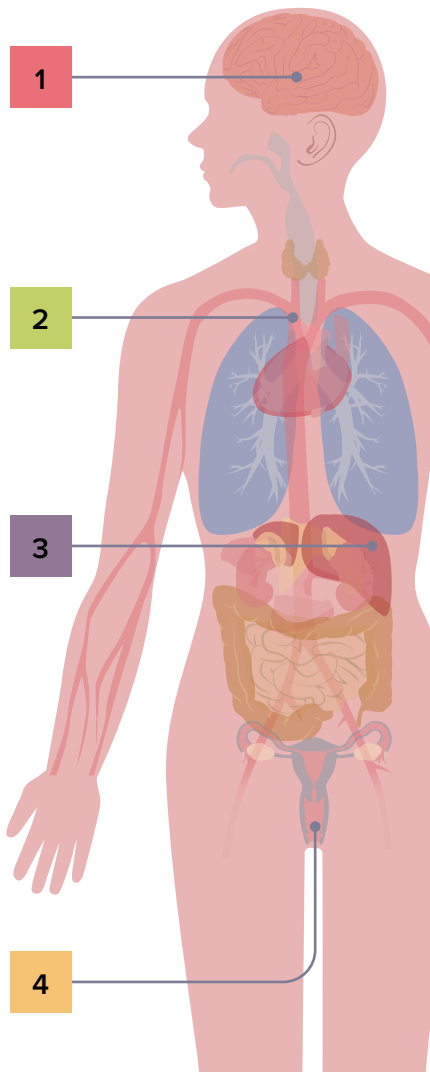




Pharmacokinetics is the movement of a drug through the body, from entrance to exit.



1. Absorption

Movement from site of administration to bloodstream

Common routes of administration:

- Oral
- Intravenous (IV)
- Intramuscular (IM)
- Subcutaneous (SubQ)
- Transdermal
- Pulmonary/nasal

Bioavailability is the extent and rate at which the drug enters the systemic circulation.

Bioavailability is 100% in IV administration, but varies widely in all other routes.

2. Distribution

Transport through systemic circulation to target tissues or organs

Influenced by:

- Adequate blood flow
- Ability of drug to exit vascular system
- Ability of drug to enter target cell

Factors that may limit distribution:

- Vascular damage due to chronic disease, such as diabetes
- Limited blood supply to abscesses or tumors
- Tight junctions of the blood-brain barrier

3. Metabolism

Chemical alteration, or biotransformation, of a drug to make it pharmacologically active or to facilitate elimination

Primarily occurs in the liver:

Effects of metabolism vary by drug, may include:

- Conversion from lipid-soluble to water-soluble compound
- Inactivation of drug
- Bioactivation of 'prodrug'
- Increased or decreased toxicity

4. Excretion

Removal of drug from the body

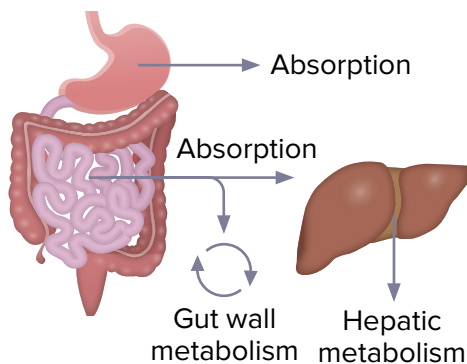
Most drugs are filtered by the kidneys and eliminated in the urine. Special care must be taken in clients with renal disease or kidney failure.

Other routes of excretion:

- Bile → feces
- Lungs (primarily anesthetics)
- Sweat and saliva
- Breast milk (caution during lactation)

1 2 First pass effect

Drugs absorbed through the GI tract pass through the liver before entering the systemic circulation. Hepatic metabolism decreases bioavailability.



3 4 Cytochrome P450 system

- A group of 12 closely related enzyme families responsible for metabolism of most drugs
- Genetic variability in CYP450 enzyme function contributes to differences in individuals' ability to metabolize drugs.
- Many foods and medications can inhibit or induce the CYP450 enzyme system.
- It is important to counsel clients regarding the potential food and drug interactions of their specific medications.

NOTES

