

## Pharmacokinetics Class Preparation

### Nursing 101

GI SYSTEM: The oral medication reaches the systemic circulation through the GI system. As a result, numerous factors can affect the absorption of the pill.

Questions:

1. A client is experiencing diarrhea. How could this affect absorption of an oral drug?  
**Diarrhea could affect absorption of an oral drug by decreasing the amount of medication that the body absorbs. Since the client is having many bowel movements, the medication may not have the proper time to absorb.**
2. How could the presence of food in the stomach affect the rate of absorption?  
**Having no food in the stomach may cause the medication to be absorbed too quickly whereas food in the stomach may cause the medication to be absorbed adequately and as intended.**

CARDIOVASCULAR SYSTEM: Once the pill is absorbed into the bloodstream, it is carried or delivered to the sites of pharmacologic action where the drug produces its effects.

Question:

3. How do you think the distribution of the oral medication affected if a client has less than normal cardiac output? **If a client has less than normal cardiac output, then the distribution of the oral medication will be hindered, not be able to reach its intended effect/duration in the body, or even delayed.**

LIVER: Most biotransformation takes place in the liver. Any decrease in the ability of the liver to metabolize medication could lead to an accumulation of the active drug in the bloodstream. This could put the client at risk for toxic effects and adverse reactions.

Questions:

4. How might nutritional status affect metabolism? **Malnourishment may affect metabolism by impairing medication metabolism because malnourished clients can be deficient in factors that influence/produce specific medication-metabolism enzymes necessary for making medications less active or inactive. Without these enzymes, the medications could remain active for too long and become toxic in the bloodstream.**
5. What factors influence the rate of medication metabolism? **Some of the factors that influence the rate of medication metabolism are age, an increase in medication-metabolizing enzymes, the first-pass effect, multiple medications using similar metabolic pathways, and nutritional status.**

KIDNEYS: Drug excretion/elimination occurs mainly through the kidneys into the urine. If there is any impairment in kidney function, medications may not be excreted at the anticipated speed. Subsequent medication administration may lead to accumulation and potential toxicity.

Questions:

6. Why would very young and very old clients need to be closely monitored by nurse for signs and symptoms of drug toxicity? **Very young or very old clients usually have a harder time expressing the need to use the restroom when they are unable to. Understanding the signs and symptoms of these client populations regarding urinary retention as well as close monitoring by the nurse can ensure swift intervention so that drug toxicity cannot build up in the body.**
7. How can the nurse assess kidney function? **The nurse can assess kidney function by monitoring BUN levels, creatinine levels, and measuring a urinary output of at least 30 mL per hour to ensure that no medication toxicity is building up.**