

## 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?  
The drug will have less time to be absorbed because the GI tract empties faster when a client is experiencing diarrhea.
2. How could the presence of food in the stomach affect the rate of absorption?  
Typically food slows down the rate of absorption.

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? Distribution of medication would be slower if a client has decreased cardiac output due to the fact that blood flow is slower, causing delayed distribution of medication throughout the body.

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? Malnourished clients may be unable to produce "medication-metabolizing enzymes" that would prevent their ability to metabolize efficiently
5. What factors influence the rate of medication metabolism? Elevated enzymes, increased renal excretion, peripheral vascular disease, liver failure, malnourishment, and concurrent medications using the same metabolization pathway

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? Both of these demographics are at an increased risk for drug toxicity. Very young clients have immature kidneys that may be unable to process medications the same way a mature client would. Elderly clients may have decreased kidney function as they age and may be on multiple medications at once.
7. How can the nurse assess kidney function? Assessing urine output, monitoring fluid balance, analyze lab results, and monitor vital signs.