

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 the absorption of an oral drug?
 - **The pattern of absorption varies greatly due to gastric emptying time; the barrier of absorption in the GI tract must also pass through the layer of epithelial cells that line the GI tract. If the patient is experiencing diarrhea, they may be emptying faster than the medication can be absorbed by the epithelial cells.**
2. How could the presence of food in the stomach affect the rate of absorption?
 - **The presence of food in the stomach can affect the rate of absorption because the medication needs to be processed. If there is too much food, it will take longer for it to pass through the GI tract.**

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

Question:

3. How do you think the distribution of the oral medication is affected if a client has less than normal cardiac output?
 - **Conditions that inhibit blood flow or perfusion, such as peripheral vascular or cardiac disease, can delay medication distribution. If the oral medication is not lipid-soluble or has a transport system that can cross the blood-brain barrier and placenta, then the oral medication administered may not diffuse properly or at all.**

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?
 - **If a patient is malnourished, they can be deficient in the factors that are necessary to produce specific medication-metabolizing enzymes, which leads to impaired medication metabolism**

5. What factors influence the rate of medication metabolism?
 - **Age, an increase in some medication-metabolizing enzymes in the body, first-pass effect, which means that the liver inactivates some medications on its first pass through the liver. Similar metabolic pathways occur when the same pathway metabolizes two medications; it can alter the metabolism of one or both, 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 a nurse for signs and symptoms of drug toxicity?
 - **Older adults may need smaller doses due to metabolism, because of a high possibility of accumulation of the specific drug in the body, which can lead to toxicity.**
7. How can the nurse assess kidney function?
 - **The nurse can measure and monitor pt urine output and look out for any bladder distension during assessment and evaluations.**