

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?
If a patient is emptying their intestines very quickly the oral drug may not have enough time to pass through the layer of epithelial cells in the GI tract before it is exited through the stool.
2. How could the presence of food in the stomach affect the rate of absorption?
If there is food present in the stomach of the patient it delays gastric emptying time and stimulates bile flow, which allows the medication to have time to be absorbed through the GI's tract epithelial cells before elimination.

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 the oral medication is absorbed into a bloodstream that does not have normal cardiac output, the blood flow will not be as strong. Possibly causing the medication to not be absorbed by the blood and not being properly distributed to the area of the body where the drug produces its effects.

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? Clients who do not have sufficient nutrition can be deficient in factors that produce medication-metabolizing enzymes, therefore impairing medication metabolism in the body.
5. What factors influence the rate of medication metabolism?
Age, increase in medication-metabolizing enzymes, First pass affect, 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? Due to younger and older clients having either decreased or increased absorption and kidney function. Older clients will likely have decreased kidney function, while the younger clients will likely have and increased kidney function.
7. How can the nurse assess kidney function? By monitoring BUN and creatinine levels.