

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 affect of a oral drug is highly dependent on the amount of time it has to be absorbed by the stomach and spread to the rest of the body. If someone has diarrhea, they are frequently eliminating waste causing the medication to move through the digestive tract quicker than normal. This reduces the absorption time resulting in a less affective dose of the medication and will causes a delay in the medications affects.
2. How could the presence of food in the stomach affect the rate of absorption?
The presence of food in the stomach could cause a decrease in effects because of the other products in the stomach absorbing the medication while other times depending on the type of medication it can help speed up results and cause the medication to take affect quicker.

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 client has less, then normal cardiac output it could delay the medication distribution cause delayed affects. If the client has cardiac output that is quicker than normal, then the effects of the medication will occur before the expected time frame.**

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 the client is malnourished they can have deficient factors that are needed to produced specific medication metabolizing enzymes there fore they medication will not be absorbed at the rate or amount that is expected.**
5. What factors influence the rate of medication metabolism? **Age affects the rate of medication metabolisms. Infants have a limited capacity to metabolizes the**

medication. If there is an increase on medication metabolizing enzymes the medication can be metabolized soon which requires a increase in dosage so it has the expected effect on the client. The liver can also inactivate some medications on its first pass through the liver mean they require a different route of absorption such as an IV. There may also be similar metabolic pathways that can alter the metabolism in one or both pathways. The rate may decrease which can cause medication accumulations.

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? **Young clients have kidneys that are not fully matured which leads to reduced filtration which slows down the rate of excretion of the drugs which can cause it to build up in the body. Old clients similarly have decreased kidney function causing decreased filtration which can cause the body to accumulate the drugs since they are not being excreted at the necessary rate.**
7. How can the nurse assess kidney function? **The nurse can be observed for any edemas which can apply water retention and there urine output could be decreased which also is a sign of improper filtration. They may also experience painful or difficulty urinating.**