



DRUG INTERACTIONS

WHAT ARE DRUG INTERACTIONS?

Prescription medication dosages need to be high enough to fight a specific disease but low enough to avoid causing too many side effects. Other medications, non-prescription (over-the-counter) drugs or recreational drugs, herbal products or even food sometimes cause large changes in the amount of a medication in your bloodstream. An overdose can cause serious side effects. An under-dose can mean that the medication will not work.

Everyone taking anti-HIV drugs should be very careful about drug interactions.

HOW DOES THE BODY PROCESS DRUGS?

Our body recognizes drugs as "foreign substances." It removes them, usually in urine or in bowel movements. Many drugs are removed unchanged by the kidneys in urine. Other drugs must be processed by the liver. Enzymes in the liver change drug molecules, and then they are eliminated in urine or in bowel movements.

When you take a pill, the drug goes from the stomach to the intestine and then into the liver before circulating to the rest of the body. If the drug is easily broken down by the liver then very little of the drug reaches the body.

HOW DO DRUGS INTERACT?

The most common drug interactions involve the liver. Several drugs can slow down or speed up the action of liver enzymes. This can cause big changes in the blood levels of other drugs that are broken down by the same enzyme.

A few drugs slow down the kidneys. This increases the blood levels of substances that are normally removed by the kidneys.

WHY DOES FOOD MATTER?

Any pills that you take go through the stomach. Most drugs are absorbed faster if the stomach is empty. For some medications, this is a good thing, but it can also cause more side effects. Some medications need to be taken with food so

that they are broken down more slowly or to reduce their side effects. Other medications are taken with fatty foods because they dissolve in fat and are absorbed better.

Stomach acid breaks down some drugs, including ddl (didanosine, Videx®). The original ddl tablets include an antacid buffer that protects the drug from stomach acid. The buffer, however, interferes with the absorption of indinavir (Crixivan®), so these drugs should not be taken at the same time. Newer versions of ddl are easier to take.

WHAT DRUGS CAUSE THE MOST INTERACTIONS?

Protease inhibitors and non-nucleoside reverse transcriptase inhibitors are processed by the liver and cause many drug interactions.

Some other types of drugs that are likely to cause interactions include:

- Antifungal drugs with names that end in "-azole"
- Some antibiotics (names end in "mycin")
- The antacid cimetidine (Tagamet®)
- Some drugs that prevent convulsions, including Dilantin® and Tegretol®.

NOTE: This is not a complete list. Other drugs may also cause interactions.

WHAT OTHER DRUGS NEED SPECIAL ATTENTION?

With some drugs, just a little too much can cause a dangerous overdose, and if the amount is just a little too low, the drug might not work. This is called having a "narrow therapeutic index". If you are taking this type of drug, any interactions could be dangerous or possibly fatal.

Drugs to watch out for include:

- Some antihistamines
- Drugs to control heart rhythm
- Some pain killers derived from opium
- Propulsid®, which increases bowel activity
- Some sedatives, including Versed® and Halcion®
- Drugs to thin the blood, including Coumadin®

- Methadone
- Drugs to treat erectile dysfunction such as Viagra
- Some drugs used to treat tuberculosis, especially rifampin

Other drugs to watch out for include **recreational drugs**. There are no careful studies of interactions with recreational drugs, but there have been reports of overdoses and death caused by taking recreational drugs while taking anti-HIV drugs. You can find more information at Party Smarty Marty's HIV/Recreational Drugs Interactions at <http://www.hafci.org/drugs/>

Women taking **birth control pills** should talk to their doctor about drug interactions. Some anti-HIV drugs can lower the levels of these drugs. This could result in an unwanted pregnancy.

WHAT ABOUT HERBAL PRODUCTS?

There has been very little research on interactions between herbal products and medications. Recent treatment guidelines indicate that St. John's Wort should not be taken along with any protease inhibitor or non-nucleoside reverse transcriptase inhibitor. See fact sheet #729 for more information on St. John's Wort. Garlic also can reduce blood levels of anti-HIV drugs. Garlic supplements, or possibly large amounts of garlic in food, might cause problems for someone using saquinavir as the only protease inhibitor in their regimen.

THE BOTTOM LINE

Many drugs to treat HIV can interact with other medications, drugs, or herbal products. These interactions can lead to serious or fatal overdoses of some drugs, or can drop drug levels too low to do any good. **You and your physician should carefully review the information that comes with each medication (the "package insert"). Ask for this information for each drug that you are taking. Also, be sure that a doctor reviews ALL medications, drugs and herbs you are taking.**

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