



DRUG INTERACTIONS

WHAT ARE DRUG INTERACTIONS?

Prescription drug dosages need to be high enough to fight a specific disease but low enough to avoid causing serious side effects. Large changes in the amount of the drug in your bloodstream can be caused by prescription and non-prescription (over-the-counter) drugs, recreational drugs, herbal products, or food. This is called a "drug interaction."

Drug interactions are very common. There are several reasons:

- Health care providers may not be aware of interactions with drugs they prescribe.
- Several health care professionals may prescribe medications for one patient
- Aging patients have multiple health issues and take many medications
- Drug interactions may not be identified as the cause of unexpected treatment results or side effects
- Health care providers may not know about all medications and supplements their patients are taking

Everyone taking antiretroviral (ARV) drugs should be very careful about drug interactions. Many pharmacies will check for drug interactions if you provide a list of all the medications you are taking. Make sure all of your health care providers know about ALL drugs and supplements you are taking. Keep this list updated!

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 are processed by the liver. Enzymes in the liver change drug molecules, and then they are eliminated in urine or in bowel movements.

When you swallow a pill, the drug goes from the stomach to the intestine and then into the liver before circulating to the rest of the body.

HOW DO DRUGS INTERACT?

The most common HIV drug interactions involve the liver. Several drugs slow down or speed up the action of liver enzymes. This can cause big changes in the blood levels of other drugs that use 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 drugs, this is a good thing, but it can cause more side effects. Some drugs need to be taken with food so that they are broken down more slowly, or to reduce their side effects. Others should be taken with fatty foods because they dissolve in fat and are absorbed better. Stomach acid is needed for some medications to reach needed blood levels. They should not be taken at the same time as antacids.

WHAT CAUSES THE MOST INTERACTIONS WITH HIV MEDICATIONS?

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. Be careful with drugs such as:

- Antidepressants
- Antihistamines
- Drugs to control heart rhythm
- Sedatives, including Versed and Halcion
- Drugs to thin the blood, including warfarin (Coumadin)
- Methadone and buprenorphine
- Pain killers derived from opium

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

Other drugs to watch out for include **recreational drugs**. There are no careful studies of interactions, but there have been reports of overdoses and death caused by taking recreational drugs together with ARVs. You can find more information at Risky Cocktails http://www.thebody.com/asp/apr03/risky_cocktails.html

Women taking **birth control pills** should talk to their provider about drug interactions. Some ARVs 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 (see fact sheet 729) should not be taken with any protease inhibitor or non-nucleoside reverse transcriptase inhibitor. You can also check for drug-drug and drug-herb interactions at the web site <http://www.hiv-druginteractions.org/Interactions.aspx> or choose "Check Interactions" at <http://www.drugdigest.org/wps/portal/ddigest>

THE BOTTOM LINE

Many ARVs can interact with other medications, drugs, or herbal products, and the list of interactions keeps growing. 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 health care provider 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 your care providers review ALL medications, drugs, and supplements or herbs you are taking.**

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