

It's Not Just the Drugs You Take, But the Drugs You Took

By Christina Johnson | May 07, 2015

The foods we eat and the drugs and supplements we take can interact with each other, causing what are known as drug interactions. More precisely, a drug interaction occurs when a drug, food or supplement affects the safety or efficacy of another drug.



Though many drug interactions can be prevented or corrected by altering medication regimens and dietary habits, as much as 3 percent of hospitalizations in the United States are estimated to be due to harmful drug interactions.

“Anyone taking several medications may be at risk of a

clinically significant drug interaction and should carefully review their medication regime with a pharmacist and doctor,” said Joseph Ma, PharmD, associate professor, UC San Diego Skaggs School of Pharmacy and Pharmaceutical Sciences.

A common cause of many drug interactions is an alteration in the activity of drug-metabolizing enzymes in the liver or small intestine, called cytochrome P450 or CYP enzymes. Approximately 50 percent of all drugs on the market are metabolized by these enzymes and any change in their activity can affect the amount of a drug in the blood stream.

Here are a few important drug interactions, reported in the scientific literature.

Grapefruit juice and the blood pressure and angina treatment felodipine (Plendil)

Grapefruit juice contains a compound that inhibits a CYP enzyme in the small intestine that metabolizes felodipine, increasing the amount of the drug in the blood stream by up to 112 percent, Ma said. The resulting drop in blood pressure can be particularly dangerous for older adults.

The oral antifungal ketoconazole and the statin simvastatin (Zorcor)

The antifungal is also a strong CYP enzyme inhibitor that will cause statin levels in the blood

stream to rise. There are case reports of this interaction contributing to severe muscle breakdown in older adults, Ma said.

Other drugs that can lower CYP enzyme activity include the antifungal itraconazole, the antacid cimetidine (Tagamet), the antibiotics erythromycin and clarithromycin, the antidepressant fluvoxamine (Luvox) and the calcium channel blocker verapamil.

The herbal supplement St. John's wort and the HIV treatment indinavir (Crixivan)

Taken for depression, St John's wort enhances the activity of CYP enzymes, dramatically decreasing the amount of the drug into the blood stream. When combined with the antiviral indinavir, the interaction can lead to the development of drug resistance and HIV treatment failure, Ma said.

Other examples of drugs that activate CYP enzymes include the antibiotic rifampin and the antiseizure medication carbamazepine (Tegretol).

Chelation


Fortified cereals, iron supplements and calcium supplements contain metals (such as iron, magnesium and calcium) that can chelate – bind to – certain medications taken by mouth, creating insoluble compounds that are unable to pass through the intestinal wall and enter the blood stream. A couple common interactions include iron supplements and the thyroid medication levothyroxine and calcium supplements with the antibiotic ciprofloxacin (Cipro). "You can avoid these interactions by separating the ingestion of metal-containing supplements and medications by several hours," Ma said.

Drugs with a Narrow Therapeutic Range

The anticoagulant warfarin (Coumadin) has a narrow therapeutic range, meaning that small changes in the amount of the drug in the blood stream will diminish the drug's therapeutic value, either by making it less effective at preventing blood clot formation or by increasing the risk of bleeding. Garlic, ginseng and ginkgo biloba can all increase bleeding risk and should be avoided with this drug, Ma said. People should also try to keep their intake of vitamin K, found in leafy greens such as kale and spinach, as consistent as possible, as vitamin K promotes blood clot formation. Warfarin, in fact, works by decreasing vitamin K activity.

Managing a Drug Interaction

Ma recommends compiling a list of all current medications, including over-the-counter and herbal supplements, and reviewing it with a physician and pharmacist. It is also valuable, he said, to discuss your past disease history and current health status.

You can also download the free app [Epocrates](#)  to find information on drug interactions. But don't try to self-diagnose your situation, instead gather information and discuss what you've learned with a health care professional.

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