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Food and Drug Interactions

By Norman Tomaka, C.R.Ph.

Food can interact with the effectiveness of medications in many different ways. Food can change the rate at which medication is absorbed into the bloodstream. Food can also increase or decrease the total amount of the medication absorbed. Therefore, food can alter the time of medications' reaction in the body and the total amount of medication delivered.

Different types of food/ drink can have different effects on medication. A meal high in fat may actually increase the absorption of some products, while significantly decreasing delivery of other medications.

The temperature of food and drink can also have a varying effect on medication. Hot liquids, like coffee and tea, can dissolve the release mechanism of certain timed-release products. This may produce higher than desirable blood levels soon after the medication is taken. The volume of liquid can also effect the delivery of medications. Generally speaking, increased volume of neutral liquids, like water,

enhances the dissolution of tablets and capsules in the gastrointestinal tract (stomach and intestine). This usually helps prevent medications from staying in the stomach too long and causing a local irritation of the stomach lining. The ph of certain foods or liquids may also have a dramatic effect on the delivery of some medications through the stomach and intestines. To summarize, the oral route of administration presents numerous challenges to patients in predicting the outcome of their medications. Because of all the different medications, food, liquids, ph, temperature and other factors involved, you may want to ask your pharmacist to look at your medications, your lifestyle, your medical condition and then predict the best method for you. Search for the easiest, optimal regimen. Sometimes, for example, food-medication interactions can be avoided simply by altering dosage times.

The following comments have to do with interactions of

some common foods with drugs.

Grapefruit Juice Natural grapefruit juice contains "flavonoids". Some of the flavonoids in grapefruit juice, especially naringenin, affect the activity of the liver. This affect in the liver may seriously alter the metabolism and concentration of some medications. Complications have been documented with:

felodipine (Plendil®)
nifedipine (Adalat®, Procardial®)
verapamil (Calan®, Isoptin®, Verelan®)
terfenadine (Seldane®, Seldane®-D)
astemizole (Hismanal®)
cyclosporine (Sandimmune®)

Oatmeal/Bran/Fiber Fiber products taken with any medication and vitamin products often slows the transport of the tablet or capsule in the gut. The delay in transport can sometimes reduce the product dissolution and decrease the amount absorbed into the blood. This would reduce the effect of the product. However, the delayed transport caused by fiber may

sometimes increase the absorption of other products depending on the unique chemical properties. Increased absorption of some vitamins occurs when fibrous foods are eaten with the vitamin. This is an unpredictable event. It is best to take any product one hour before or two hours after eating fiber.

Licorice Natural black licorice contains glycyrrhizin. Glycyrrhizin has been associated with some potent side effects if taken in large amounts (more than one ounce of natural black licorice, especially if a patient is using potassium-depleting diuretics and/or digoxin (Lanoxin®). Look for natural licorice in cough drops, candy, Chinese herbal medications and other hidden sources.

Salt Substitutes Sodium-free or reduced sodium salt products often contain potassium chloride, which has the salty taste without the potentially hazardous sodium. Be aware of overusing these products. Even casual use can be adverse when a patient is already supplementing potassium, or using potassium-sparing diuretics or ACE inhibitors to treat high blood pressure or congestive heart failure. The best advice is to consult your physician or pharmacist.

Coffee and Tea It is important to remember that naturally

brewed coffee and tea contain caffeine. Caffeine is a stimulant that, by itself, may increase the heart rate and blood pressure (temporarily). For most patients, moderate use of caffeine is not adverse. However, taking medications with caffeine may pose a series of challenges to the medication's response. Caffeine may be enhanced by the administration of certain medications. Some products slow elimination of caffeine. Other medications' effects may be increased by caffeine. While it contains less caffeine than coffee, tea contains tannins which are responsible for taste and the "stain" associated with tea. Tannin in all tea can significantly reduce the absorption of iron from a nutritional supplements or food. It may be best to limit caffeine use when taking the following medications:

cimetidine (Tagamet®) May increase caffeine's effect.
quinolone antibiotics May extend caffeine's effect.
ciprofloxacin (Cipro®)
norfloxacin (Noroxin®)
floxacin (Floxin®)
enoxacin (Penetrex®)
lomefloxacin (Maxaquin®)
theophylline products Caffeine is chemically related to theophylline and may increase this medication's effectiveness and side effects.

In conclusion, enjoy moderate amounts of coffee and tea one hour before or two hours after taking any medication or vitamin product. Remember that caffeine is also found in certain over-the-counter medications. Be sure to read the label.

Dairy Products (Calcium)

A popularized food-drug interaction is medication taken with milk or other dairy products. Calcium and related minerals found in food and other sources (i.e. antacids, vitamins) can sometimes chemically "hold on" to the medication and reduce absorption from the gut into the blood. This interaction is avoidable by time spacing. Ask your pharmacist if it is best to avoid taking your medication with dairy products, vitamins or antacids. If so, you may enjoy the benefits of yogurt, ice-milk, etc., one hour before or two hours after your medication dose.

Some products, which should be taken apart from dairy products, include:

quinolone antibiotics Some will experience reduced absorption especially Cipro®, Floxin® and Noroxin®.
tetracycline antibiotics Select tetracyclines will experience minimal absorption and effectiveness when taken with milk.
etidronate (Didronel®) Substantial reduction in absorption.

bisacodyl (i.e. Dulcolax®)

Dissolves coating on tablet and reduces absorption while increasing stomach irritation.

There can also be interactions between drugs and vitamins. Some common interactions are:

Additives/ Excipients Vitamins may contain additives that could interfere with some medications:

starch

wheys

wheat

starch

lactose (generic term)

film coating (some)

artificial colorings

gluten

While most vitamins labeled, manufactured and sold in U.S. pharmacies are now regulated by the FDA, additives may still be included as an excipient.

“Natural vitamins” usually avoid starch and sugar additives. Many products are labeled gluten and lactose free. Read the listed ingredients carefully.

While the small amount of additives in most vitamin products may be of little consequence for occasional use, routine daily vitamins, which contain additives, such as lactose, may cause a problem if taken with certain medications.

Vitamin K Anticoagulant use (i.e. Coumadin®) is antagonized by Vitamin K. For most patients

Vitamin K is easily found in green leafy vegetables like cabbage, brussels sprouts, broccoli, cauliflower, turnip greens and spinach. Other sources include soybeans, lentils, watercress, liver, eggs, bran, chick-peas, oats and corn-oil. It is best for patients on warfarin (Coumadin®) to keep their diet routine. Elimination or excessive use of typical sources of Vitamin K will work against the predicted results of the bloodthinner. If your diet does change, always let your physician know.

Vitamin E Rightfully touted for its antioxidant properties, Vitamin E is supplemented by many patients trying to lower their risk of cardiovascular complications. Because Vitamin E may improve blood flow, aspirin, Coumadin® and other “blood thinners” may be enhanced by sudden use of Vitamin E (d-alpha tocopheryl). It is best not to stop or begin using this supplement while on anticoagulants without first checking with your physician. However, most patients can continue to use Vitamin E while taking Coumadin® provided the physician is aware.

CoEnzymeQ This nutritional supplement may be of benefit to some patients with congestive heart and gum

disease. However, “Co-Q” has significantly reduced the blood-thinning effect of Coumadin®. It is best to communicate with your physician before starting or stopping “Co-Q” use, especially while taking Coumadin®. There have been recent reports of the same interaction occurring with “Ginkoba” and other Ginseng derivatives, (other nutritional products unrelated to “Co-Q”).

Beta Carotene Beta-carotene is an excellent antioxidant with reduced toxicity often associated with other forms of Vitamin-A. However, combined routine use of alcohol and Beta Carotene may seriously harm the liver. Patients routinely using alcohol (not just excessive use, but routine use) should avoid supplementing any form of Vitamin A, including Beta Carotene. Long term routine use of Beta Carotene may significantly lower blood concentrations of Vitamin E. Patients are usually recommended to supplement both vitamins for the best health advantage.

Vitamin B-12 B-12 (cyanocobalamin) requires certain chemical factors in the stomach lining to allow regular absorption from the diet. Certain medications used to reduce stomach acid can reduce blood levels of Vitamin B-12. Examples include cimetidine (Tagamet®), ranitidine (Zantac®) and omeprazole

(Prilosec®) and lansoprazole (Prevacid®). It may be good advice to supplement a B-Complex with vitamin B-12 while using these medications. Stomach surgery may also necessitate supplementing B-12. Ask your physician. Potassium products, often prescribed to patients using certain diuretics, can also reduce B-12 absorption. Slow-K®, K-Dur®, and Micro-K® are examples of potassium.

B Complex (especially folic acid, B-6) Many medications can lower blood levels of folic acid and other B vitamins. Phenytoin (Dilantin®), estrogen (Premarin®), hydralazine (Apresoline®), steroids (prednisone), methotrexate (Rheumatrex®) and diuretics (Dyazide®, Maxzide®, Hctz®) all have been shown to reduce blood concentrations of folic acid and sometimes B6. In most cases, simply supplementing a balanced multi-vitamin with B-complex every day, may prevent complications associated with B-vitamin depletion.

Important Questions to Ask Your Pharmacist About Drug Interactions

- (1) Should this medication be taken with or without food?
- (2) Is it best to take this medication with water, fruit juice or another liquid?
- (3) Will warm beverages like coffee or tea effect this medication?

(4) If the medication is recommended to be taken “on an empty stomach,” what increment of time before or after eating is best?

(5) If the patient has any “oral-stomach-intestine” disorder (dry-mouth, sores, diarrhea, hemorrhoids, ulcers, heartburn or vomiting), how can the medication effect the disorder? Should dosage time change due to diarrhea or vomiting?

(6) If the patient finds swallowing difficult, may this medication be chewed or crushed?

(7) May alcohol be used while taking this medication? Is a time interval between medication and alcohol recommended?

(8) Should any food be avoided while taking this prescription, especially with thyroid supplements?

(9) Can several of the patient’s medications be taken together with food?

(10) If stomach upset occurs, may an antacid be taken with the medication to prevent irritation? If so, which type of antacid is best for me?

(11) Should certain foods/drinks be added to the patient’s diet to prevent nutrient loss, like potassium? What foods and/or drinks are recommended?

(12) May the patient use their normal vitamin supplements? When should the vitamins be taken?

(13) If the medication is timed-release, how long is the predicted action?

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