

LE Magazine March 2006

## REPORT

### Preventing Pharmaceutical-Induced Nutritional Deficiencies

By Frederic Vagnini, MD, and Barry Fox, PhD



While pharmaceuticals have lifesaving benefits, many of these medications can have serious side effects, ranging from cardiac arrest to suicide.

Millions of Americans suffer from an almost completely ignored epidemic of drug-induced nutrient depletion that can cause grave health problems. Perhaps 30% of pharmaceutical side effects are the direct result of these drug-induced nutrient deficiencies. In other words, a drug “robs” you of one or more nutrients or other helpful substances, and this lack of nutrients causes additional side effects. In a sense, the drug acts as an “anti-vitamin pill,” taking away the substances you need for good health. Thus, nutrient depletion caused by the drugs—rather than the drugs themselves—is often directly responsible for many of the side effects associated with pharmaceuticals.

Among the most common drugs linked to nutrient depletion are oral contraceptives, cholesterol-lowering statins, and antibiotics. These and many other over-the-counter and prescription medications can interfere with your body’s ability to digest, absorb, synthesize, or make use of certain nutrients, leading to nutrient deficiency-related “side effects.”

The only solution to averting drug-induced nutritional deficiencies is to replace the depleted nutrients through nutritional supplements, dietary sources, or both. In this article, we examine some commonly prescribed drugs and the vitamins, minerals, and other substances they are most likely to deplete.

#### **ALUMINUM ANTACIDS (GAVISCON®, MAALOX®, MYLANTA®)**

Popular over-the-counter remedies for heartburn, aluminum antacids are weak bases designed to neutralize excess stomach acid and keep it from burning the esophagus.

#### ***Which Nutrients Are Robbed***

Taking aluminum antacids may deplete your supply of, increase your need for, or interfere with the activity of:

- vitamin A
- folic acid
- vitamin D
- calcium
- chromium
- iron
- magnesium
- phosphorus
- zinc.

#### ***Restoring the Nutrient Balance***

Speak to your physician about taking 5000 IU of vitamin A, 800 mcg of folic acid, 1000-2000 IU of vitamin D, 1200 mg of calcium, 700 mcg of chromium, 1500 mg of magnesium, and 50-100 mg of zinc. Ask your physician to consider the potential effects of iron and phosphorus depletion. You can also eat foods that contain the depleted nutrients.

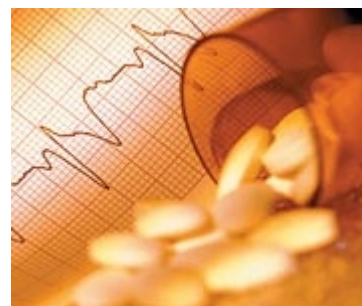
#### **ATENOLOL (RHOXAL-ATENOLOL®, TENOLIN®, TENORMIN®)**

Atenolol is a beta-blocker used to treat angina and elevated blood pressure, prevent migraines, and reduce the odds of further complications in those who have had a heart attack.

### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- coenzyme Q10
- melatonin.



### ***Restoring the Nutrient Balance***

To compensate for the nutrient loss caused by this drug, speak to your physician about taking 100-300 mg of coenzyme Q10 and 1-3 mg of melatonin. You can also eat foods that contain the depleted nutrients.

## **CIPROFLOXACIN (CIPRO®, CILOXAN®)**

Ciprofloxacin is an antibacterial agent used to treat infections of the urinary tract, lower respiratory tract, sinuses, and other parts of the body.

### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- biotin
- inositol
- thiamin
- riboflavin
- niacin
- vitamin B6
- vitamin B12
- vitamin K
- zinc
- Bifidobacteria bifidum
- Lactobacillus acidophilus.

### ***Restoring the Nutrient Balance***

Speak to your physician about taking 500-1000 mcg of biotin, 250-1000 mg of inositol, 25-200 mg of thiamin, 25-100 mg of riboflavin, 50-100 mg of niacin, 100 mg of vitamin B6, 500-1000 mcg of vitamin B12, 1-10 mg of vitamin K, 50-100 mg of zinc, 15 billion live Bifidobacteria bifidum organisms, and 15 billion live Lactobacillus acidophilus organisms. You can also eat foods that contain the depleted nutrients.

## **COLESEVELAM (WELCHOL®)**

Colesevelam is used to treat elevated cholesterol, either by itself or in conjunction with a statin drug.

### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- beta-carotene
- folic acid
- vitamin A
- vitamin B12
- vitamin D
- vitamin E

- vitamin K
- iron

### ***Restoring the Nutrient Balance***

Speak to your physician about taking 25,000 IU of beta-carotene, 800 mcg of folic acid, 5000 IU of vitamin A, 500-1000 mcg of vitamin B12, 1000-2000 IU of vitamin D, 400 IU of vitamin E, and 1-10 mg of vitamin K. Ask your physician to consider the potential effects of iron depletion. You can also eat foods that contain the depleted nutrients.

### **ETHINYL ESTRADIOL PLUS NORGESTREL (OVRAL®, LO/OVRAL®, LOW-OGESTREL®)**

Commonly known as the birth control pill, this combination of synthetic estrogen and progestin is used to prevent ovulation and thus prevent pregnancy.

### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- folic acid
- magnesium
- tyrosine
- riboflavin
- niacin
- vitamin B6
- vitamin B12
- vitamin C
- zinc

### ***Restoring the Nutrient Balance***

Speak to your physician about taking 800 mcg of folic acid, 1500 mg of magnesium, 250-500 mg of tyrosine, 25-100 mg of riboflavin, 50-100 mg of niacin, 100 mg of vitamin B6, 500-1000 mcg of vitamin B12, 250-1500 mg of vitamin C, and 50-100 mg of zinc. You can also eat foods that contain the depleted nutrients.

### **FAMOTIDINE (PEPCID®, PEPCID® AC)**

Famotidine is used to treat certain types of gastritis, gastric and duodenal ulcers, gastroesophageal reflux disease (GERD), heartburn, and related conditions by reducing the amount of acid produced by the stomach lining.

### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- folic acid
- thiamin
- vitamin B12
- vitamin D
- calcium
- iron
- zinc



### **Restoring the Nutrient Balance**

Speak to your physician about taking 800 mcg of folic acid, 25-200 mg of thiamin, 500-1000 mcg of vitamin B12, 1000-2000 IU of vitamin D, 1200 mg of calcium, and 50-100 mg of zinc. Ask your physician to consider the potential effects of iron depletion. You can also eat foods that contain the depleted nutrients.

### **FLUOXETINE (PROZAC®)**

Prozac®, the first in the family of drugs called selective serotonin reuptake inhibitors (SSRIs), works by increasing the levels of serotonin in the brain to treat depression, obsessive-compulsive disorder, panic disorder, and bulimia nervosa.

#### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- melatonin

#### ***Restoring the Nutrient Balance***

To compensate for the nutrient loss caused by this drug, speak to your physician about taking 1-3 mg of melatonin each night.

### **GLYBURIDE PLUS METFORMIN (GLUCOVANCE®)**

A combination drug used to treat diabetes, glyburide stimulates the pancreas to produce larger amounts of insulin, while metformin helps remove excess glucose from the blood while slowing the release of additional glucose.

#### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- folic acid
- vitamin B12
- sodium
- coenzyme Q10

#### ***Restoring the Nutrient Balance***

To compensate for the nutrient loss caused by this drug, speak to your physician about taking 800 mcg of folic acid, 500-1000 mcg of vitamin B12, and 100-300 mg of coenzyme Q10. Ask your physician to consider the potential effects of sodium depletion. You can also eat foods that contain the depleted nutrients.

### **HYDROCODONE PLUS ACETAMINOPHEN (HYDROGESIC®, LORTAB®, VICODIN®)**

Hydrocodone is an opioid painkiller that, like morphine, works by imitating the body's own endorphins. Acetaminophen slows the production of the prostaglandins that "encourage" pain.

#### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- glutathione
- selenium

#### ***Restoring the Nutrient Balance***

To compensate for the nutrient loss caused by this drug, speak to your physician about taking 600-1200 mg of N-acetylcysteine, a precursor to glutathione, along with 200 mcg of selenium.

## **MAGNESIUM HYDROXIDE (PHILLIPS® MILK OF MAGNESIA)**

Magnesium hydroxide is an osmotic laxative that encourages the movement of fluid into the colon, which helps to soften the stool and stimulate the action of the bowels.

### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- folic acid
- vitamin D
- calcium
- iron
- phosphorus
- zinc

### ***Restoring the Nutrient Balance***

Speak to your physician about taking 800 mcg of folic acid, 1000-2000 IU of vitamin D, 1200 mg of calcium, 700 mg of phosphorus, and 50-100 mg of zinc. Ask your physician to consider the potential effects of iron depletion. You can also eat foods that contain the depleted nutrients.

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### OMEPRAZOLE (PRILOSEC®)

Omeprazole, which interferes with the secretion of digestive acid by the proton pumps in the stomach lining, is considered first-line therapy for heartburn and other symptoms of gastroesophageal reflux disease (GERD), and associated problems.

#### *Which Nutrients Are Robbed*

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- beta-carotene
- folic acid
- thiamin
- vitamin B12
- iron
- sodium
- zinc



#### *Restoring the Nutrient Balance*

Speak to your physician about taking 25,000 IU of beta-carotene, 800 mcg of folic acid, 25-200 mg of thiamin, 500-1000 mcg of vitamin B12, and 50-100 mg of zinc. Ask your physician to consider the potential effects of iron and sodium depletion. You can also eat foods that contain the depleted nutrients.

### PHENYTOIN (DILANTIN®, DIPHENYLAN SODIUM®, TREMYTOINE®)

Phenytoin is used to treat grand mal seizures and partial seizures, and to prevent seizures in people who have had brain surgery or a head injury.

#### *Which Nutrients Are Robbed*

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- biotin
- folic acid
- thiamin
- vitamin B12
- vitamin D
- vitamin K
- calcium
- phosphorus
- carnitine

#### *Restoring the Nutrient Balance*

To compensate for the nutrient loss caused by this drug, speak to your physician about taking 500-1000 mcg of biotin, 800 mcg of folic acid, 25-200 mg of thiamin, 500-1000 mcg of vitamin B12, 1000-2000 IU of vitamin D, 1-10 mg of vitamin K, 1200 mg of calcium, 700 mg of phosphorus, and 250-2000 mg of carnitine. You can also eat foods that contain the depleted nutrients.

### PREDNISONE (DELTASONE®, LIQUID PRED®)

Prednisone is used to treat inflammatory ailments of the skin, eye, respiratory tract, gastrointestinal tract, and other areas of the body. It may also be used in organ transplants to prevent rejection.

### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- vitamin A
- vitamin B6
- folic acid
- vitamin C
- vitamin D
- vitamin K
- calcium
- magnesium
- potassium
- selenium
- zinc

### ***Restoring the Nutrient Balance***

Speak to your physician about taking 5000 IU of vitamin A, 100 mg of vitamin B6, 800 mcg of folic acid, 250-1500 mg of vitamin C, 1000-2000 IU of vitamin D, 1-10 mg of vitamin K, 1200 mg of calcium, 1500 mg of magnesium, 100-300 mg of potassium, 200 mcg of selenium, and 50-100 mg of zinc. You can also eat foods that contain the depleted nutrients.

## **PROPRANOLOL (DETENSOL®, INDERAL®)**

Propranolol is used to treat mildly to moderately elevated blood pressure, migraine headaches, angina, and certain tremors, and may be useful in treating anxiety and stage fright.

### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- coenzyme Q10
- melatonin

### ***Restoring the Nutrient Balance***

To compensate for the nutrient loss caused by this drug, speak to your physician about taking 100-300 mg of coenzyme Q10 and 1-3 mg of melatonin. You can also eat foods that contain the depleted nutrients.

## **RALOXIFENE (EVISTA®)**

Raloxifene is an estrogen agonist, which means that it plugs into estrogen receptors and triggers “a little bit” of estrogen activity, but not the full “dose.” It is used to help prevent bone loss and improve cholesterol levels, without encouraging breast or uterine cancer.

### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- vitamin B6
- magnesium

### ***Restoring the Nutrient Balance***

To compensate for the nutrient loss caused by this drug, speak to your physician about taking 100 mg of vitamin B6 and 1500 mg of magnesium. You can also eat foods that contain the depleted nutrients.

### **RANITIDINE (ZANTAC®)**

Ranitidine is used to treat duodenal and gastric ulcers, gastro-esophageal reflux disease (GERD), esophagitis, and related ailments by inhibiting the production of stomach acid.



### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- thiamin
- folic acid
- vitamin B12
- vitamin D
- calcium
- iron
- zinc

### ***Restoring the Nutrient Balance***

Speak to your physician about taking 25-200 mg of thiamin, 800 mcg of folic acid, 500-1000 mcg of vitamin B12, 1000-2000 IU of vitamin D, 1200 mg of calcium, and 50-100 mg of zinc. Ask your physician to consider the potential effects of iron depletion. You can also eat foods that contain the depleted nutrients.

### **THE “SARTANS” (MICARDIS HCT®, DIOVAN HCT®)**

The sartan drugs (including candesartan, irbesartan, losartan, telmisartan, and valsartan) are used to reduce elevated blood pressure. All are used in conjunction with hydrochlorothiazide, a diuretic.

### ***Which Nutrients Are Robbed***

Taking these medicines may deplete your supply of, increase your need for, or interfere with the activity of:

- magnesium
- phosphorus
- potassium
- sodium
- zinc
- coenzyme Q10

### ***Restoring the Nutrient Balance***

Speak to your physician about taking 1500 mg of magnesium, 700 mg of phosphorus, 50-100 mg of zinc, and 100-300 mg of coenzyme Q10. Ask your physician to consider the effects of sodium depletion, as well as to monitor your potassium status. You can also eat foods that contain the depleted nutrients.

### **SIMVASTATIN (ZOCOR®)**

Simvastatin belongs to the “statin” family of drugs used to reduce cholesterol and blood fats.

### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- beta-carotene
- vitamin E
- coenzyme Q10 (some researchers fear that the long-term use of statin drugs may cause congestive heart failure due to the reduction of coenzyme Q10 levels)



**Restoring the Nutrient Balance**

Speak to your physician about taking 25,000 IU of beta carotene, 400 IU of vitamin E, and 100-300 mg of coenzyme Q10. You can also eat foods that contain the depleted nutrients.

**TETRACYCLINE (NU-TETRA®, TOPICYCLINE TOPICAL®)**

Tetracycline is a broad-spectrum antibiotic that works against a variety of bacteria, including the kinds that cause acne, stomach ulcers, syphilis, and gonorrhea.

**Which Nutrients Are Robbed**

Taking this medicine may deplete your supply of, increase your need for, or interfere with the

activity of:

- biotin
- folic acid
- inositol
- thiamin
- riboflavin
- niacin
- vitamin B6
- vitamin B12
- vitamin C
- vitamin K
- calcium
- iron
- magnesium
- zinc
- Bifidobacteria bifidum
- Lactobacillus acidophilus

**Restoring the Nutrient Balance**

Speak to your physician about taking 500-1000 mcg of biotin, 800 mcg of folic acid, 250-1000 mg of inositol, 25-200 mg of thiamin, 25-100 mg of riboflavin, 50-100 mg of niacin, 100 mg of vitamin B6, 500-1000 mcg of vitamin B12, 250-1500 mg of vitamin C, 1-10 mg of vitamin K, 1200 mg of calcium, 1500 mg of magnesium, 15 billion live Bifidobacteria bifidum organisms, and 15 billion live Lactobacillus acidophilus organisms. Ask your physician to consider the potential effects of iron depletion. You can also eat foods that contain the depleted nutrients.

**FOOD CHOICES TO REPLENISH DRUG-DEPLETED NUTRIENTS**

Selecting foods rich in the nutrients depleted by prescription drugs provides another way to avert pharmaceutical-induced nutrient deficiencies. Below are food sources for some of the nutrients most commonly affected by prescription drugs.

**Beta-carotene:**  
carrots, spinach, mangos, cantaloupe, apricot nectar.

**Potassium:**  
dried figs, California avocado, papaya, bananas, dates.

**Bifidobacteria bifidum:**  
Jerusalem artichokes, asparagus, garlic, and onions may stimulate the growth or activity of this probiotic.

**Riboflavin:**  
dried sunflower seeds, orange juice, bulgur, spinach noodles, pine nuts.

<b>Biotin:</b> beef liver, soybeans, rice bran, peanut butter, barley.	<b>Selenium:</b> Brazil nuts, tuna, beef liver, turkey breast, spaghetti with meat sauce.
<b>Calcium:</b> milk, dried figs, Swiss cheese, oysters, spinach.	<b>Thiamin:</b> braised liver, turkey heart, roasted chicken, gefilte fish, sardines.
<b>Carnitine:</b> ground beef, pork, Canadian bacon, whole milk, cod.	<b>Tyrosine:</b> soy, turkey, chicken, peanuts, bananas, milk, cheese.
<b>Chromium:</b> broccoli, green beans, potatoes, grape juice, orange juice.	<b>Vitamin A:</b> beef liver, chicken liver, cheese pizza, whole milk, cheddar cheese.
<b>Coenzyme Q10:</b> beef, chicken, trout, salmon, oranges, and broccoli.	<b>Vitamin B6:</b> potatoes, bananas, garbanzo beans, chicken breast, fortified oatmeal.
<b>Folic acid:</b> beef liver, fortified breakfast cereals, spinach, Great Northern beans, asparagus.	<b>Vitamin B12:</b> beef liver, rainbow trout, sockeye salmon, beef, haddock.
<b>Inositol:</b> cantaloupe, oranges, green beans, grapefruit juice, limes.	<b>Vitamin C:</b> papaya, guava, red pepper, cantaloupe, black currants.
<b>Lactobacillus acidophilus:</b> yogurt containing live lactobacillus cultures, kefir, acidophilus milk.	<b>Vitamin D:</b> salmon, mackerel, sardines, eel, fortified milk.
<b>Magnesium:</b> Florida avocado, toasted wheat germ, almonds, shredded wheat cereal, pumpkin seeds.	<b>Vitamin E:</b> wheat germ oil, almonds, safflower oil, corn oil, soybean oil.
<b>Niacin:</b> chicken breast, beef liver, mackerel, barley, bulgur.	<b>Vitamin K:</b> kale, broccoli, parsley, Swiss chard, spinach.
<b>Phosphorus:</b> plain nonfat yogurt, lentils, salmon, milk, halibut.	<b>Zinc:</b> oysters, beef shank, chicken, pork tenderloin, plain yogurt.

### THEOPHYLLINE (BRONKODYL®, ELIXOPHYLLIN®, THEO-DUR®)

Theophylline is used to treat asthma by preventing the contraction of the airway muscles, slowing the release of asthma-causing chemicals, and inhibiting inflammation.

#### ***Which Nutrients Are Robbed***

Taking this medicine may deplete your supply of, increase your need for, or interfere with the activity of:

- thiamin
- vitamin B6
- phosphorus

#### ***Restoring the Nutrient Balance***

To compensate for the nutrient loss caused by this drug, speak to your physician about taking 25-200 mg of thiamin, 100 mg of vitamin B6, and 700 mg of phosphorus. You can also eat foods that contain the depleted nutrients.

## DRUGS ARE HELPFUL, BUT . . .



Pharmaceutical drugs perform many miracles every day, from controlling diabetes to containing virulent infections. However, it is important to remember that all drugs—every single one of them, even the simple and ubiquitous aspirin—have side effects, and that some of these side effects can be ameliorated or even eliminated by restoring the missing nutrients.

Information on other drugs and the nutrients they deplete is available in *The Side Effects Bible: the Dietary Solution to Unwanted Side Effects of Common Medications* by Frederic Vagnini, MD, and Barry Fox, PhD (Broadway Books, 2005).

### COMMON NUTRIENT THIEVES

You may not think twice when you pop a Tums® or take a hit of Flonase®, but some of our most commonly taken drugs (both prescribed and over the counter) are real nutrient zappers, especially when used for extended periods of time.

Brand name	Generic name	Used for	Nutrients depleted
<b>Flonase®</b>	fluticasone	hay fever, asthma	vitamin A, folic acid, vitamin B6, vitamin C, vitamin D, vitamin K, calcium, magnesium, potassium, selenium, zinc, melatonin
<b>Lanoxin®</b>	digoxin	irregular heartbeat	thiamin, calcium, magnesium, phosphorus, potassium
<b>Lasix®</b>	furosemide	hypertension	thiamin, vitamin B6, vitamin C, calcium, chloride, magnesium, phosphorus, potassium, sodium, zinc
<b>Percodan®</b>	oxycodone plus aspirin	pain	folic acid, vitamin C, iron, potassium, sodium
<b>Tums®</b>	calcium carbonate	stomach upset	chromium, iron, manganese, phosphorus
<b>Vaseretic®</b>	enalapril plus hydrochlorothiazide	heart failure	vitamin B6, magnesium, phosphorus, potassium, sodium, zinc, coenzyme Q10

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