



Drug - Nutrient Interactions

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How Drugs and Nutrients Interact

Both prescription and over-the-counter medications can affect the way your body uses nutrients in food. In addition, certain foods or nutrients in food can affect the action of medications.

A drug-nutrient interaction is the effect of a medication on food or a nutrient in food. Medications interact with foods and nutrients in several ways. Medications can decrease appetite or change the way a nutrient is absorbed, metabolized, or excreted.

A food-drug interaction is the effect of food or a nutrient in food on a medication. Dietary nutrients can affect medications by altering their absorption or metabolism. The food you eat could make the medications you take work faster, slower, or even prevent them from working at all.

Such interactions raise concerns that medications may lead to nutritional deficiencies or that your diet may change how a medication works. This does not mean that if you are taking a medication you need to use a vitamin and/or mineral supplement. There is little chance that taking a medication for a short time, such as a ten-day treatment, will affect your nutritional status. However, use of some medications for months or years may affect your nutritional health.

Children, older adults, pregnant women, people who are poorly nourished, and people with a chronic disease are at greater risk of medications affecting their nutritional health. Changing the diet to include more foods rich in vitamins and minerals is preferred to taking vitamin or mineral supplements. In fact, vitamin and/or mineral supplements taken in excess can affect how a medication works.

Drug-Nutrient Interactions

Medications, both prescription and over-the-counter, can affect how the body uses nutrients. For individuals taking medications for long periods of time drug-nutrient interactions may lead to vitamin or mineral deficiencies.

- Medications can decrease appetite or cause nausea, vomiting, an unpleasant taste, or dry mouth. This can affect nutritional health by causing poor food intake.

Example: Appetite suppressants are medications that directly affect food intake by depressing appetite.

Example: Several cancer medications and treatments may cause nausea, vomiting, sore, or dry mouth resulting in poor food intake.

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- Medications can decrease nutrient absorption.

Example: Laxatives can decrease the absorption of many vitamins and minerals. Laxatives cause food to move rapidly through the body causing poor nutrient absorption.

Example: Aluminum hydroxide contained in some antacids can bind to phosphorus in food. This can prevent phosphorus from being absorbed and used by the bones. Over time this could result in phosphorus depletion. Mild phosphorus depletion causes muscle weakness and severe cases can cause osteomalacia and severe pain in walking.

Example: Some anticonvulsants can decrease folate absorption. Folate deficiency can result in megaloblastic anemia.

Example: Some cholesterol lowering medications reduce cholesterol by removing bile acids. Bile acids are needed to absorb the fat-soluble vitamins A, D, E, and K. As a result some cholesterol lowering medications can reduce absorption of fat-soluble vitamins.

- Medications can slow down nutrient production.

Example: Vitamin K is produced by bacteria in the intestines. Antibiotics kill harmful bacteria, but they can also kill helpful bacteria. Killing the helpful vitamin K producing bacteria decreases the amount of vitamin K produced in the intestine.

- Medications can interfere with the body's ability to metabolize nutrients.

Example: Birth control pills can lower levels of vitamin B₆ and folate in the body.

- Medications can increase the loss of a nutrient.

Example: Diuretics remove excess fluid from the body. Some diuretics may also increase loss of potassium along with fluids. Potassium is very important in proper functioning of the heart and other muscles.

Example: Large amounts of aspirin can cause increased loss of folate. Also, large amounts of aspirin over long periods of time may cause stomach bleeding that could result in iron deficiency. Over time iron deficiency can lead to anemia.

Example: Some anticonvulsant medications can cause the liver to increase the removal of vitamin D from the body. Vitamin D is needed for calcium absorption.

Food-Drug Interactions

Food and nutrients can also alter a medication's effectiveness in many ways.

- Food can increase or decrease the absorption of a drug. Absorbing less than the intended dose may decrease the effect of the drug. Absorbing more than the intended dose increases the chance for an overdose effect.

Example: Dietary calcium can bind to the antibiotic tetracycline. As a result the body does not absorb the amount of antibiotic intended.

Example: Drugs are absorbed more quickly into the body when the stomach is empty. Having food in the stomach will slow down a medication's absorption. Sometimes a medication should be taken with food. Other medications should be taken on an empty stomach, one hour before or two hours after eating. It is important to read the directions to see if a medication should be taken with or without food.

Example: The type of food or beverage consumed with a medication can affect a medication's absorption. Usually, medications should be taken with water. Acidic soft drinks, juices, and foods may produce excess stomach acidity which may destroy a medication or cause a medication to dissolve in the stomach instead of the intestine. Acidic foods may dissolve a timed release medication all at once instead of over time.

- Foods or nutrients may interfere with a drug's metabolism or a drug's action in the body.

Example: Aged and fermented foods contain a chemical called tyramine that interacts with a medication, monoamine oxidase inhibitor. This interaction can result in dangerously high blood pressure.

Example: Vitamin K can decrease the effectiveness of certain anticoagulant medications.

- Foods or nutrients may be needed for the removal of a medication from the body.

Example: Liver enzymes prepare medications for removal from the body. These enzymes require nutrients to work properly. If required nutrients are not present, medications may stay active in the body longer than they are supposed to. This may cause an overdose effect.

Alcohol

Alcohol and medications do not mix well. Alcohol can adversely affect medications as well as nutrients. Alcohol can slow down the body's metabolism. As a result medications can stay active in the body longer than they were supposed to. In some cases, mixing alcohol and medications can be fatal. A rule of thumb is to avoid alcoholic beverages when taking prescription or over-the-counter medications.

Nutrient Supplements

Nutrient supplements themselves can result in drug-nutrient interactions. In excessive amounts, vitamins and minerals act like drugs instead of nutrients. Nutrients in excessive amounts may interact with other nutrients or may even be toxic.

Large amounts of zinc can interfere with copper and iron absorption. Similarly, large amounts of iron can interfere with zinc absorption.

The Importance of Following Directions

It is important to follow the directions on how to take a medication. Many people do not take prescription or over-the-counter medications properly. Following the directions on how to take a medication can affect how or if a medication works.

Who is at Risk of Drug-Nutrient Interactions?

Some people may be at greater risk of drug-nutrient interactions than others. Those considered at higher risk for drug-nutrient interactions include:

- Persons who have a poor diet.
- Persons who have serious health problems.
- Growing children.
- Pregnant women.
- Older adults.

- Persons taking two or more medications at the same time.
- Persons using prescription and over-the-counter medications together.
- Persons not following medication directions.
- Persons taking medications for a long periods of time.
- Persons who drink alcohol or smoke excessively.
- Keep a list of all medications (prescription and over-the-counter) that you use.
- If you have questions, ask your pharmacist, physician, or dietitian for answers.

How to Lower the Risk of Drug-Nutrient Interactions

- Eat a healthy diet following the recommended servings from the USDA Daily Food Plan.
- Follow directions on how to take medication (prescription and over-the-counter).
- Read warning labels on both prescription and over-the-counter medications.
- Do not share medications with others or take other people's medications.
- Do not take over-the-counter medications frequently on your own.
- Tell your physician about everything you are taking, including over-the-counter medications, alcohol, and herbal products.
- Tell your physician and pharmacist about any new or intensified symptoms that develop when taking a medication.

Questions to Ask Your Physician When You Get a Prescription

- What is the medication for? (medication name, medication purpose).
- How should I take the medication? (dosing schedule, how long, storage recommendations, recommendations on consuming food and/or beverages with the medication).
- What should I expect? (expected outcomes, precautions, side effects).

References

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A Guide to...

Food & Drug

Interactions

How to use the Guide to Food & Drug Interactions

It is important to read the first page of this guide because the information is very useful. This guide contains most of the significant food-drug interactions, but other food-drug interactions may exist. If you have any questions, please contact one of the telephone numbers listed on the back of this guide or ask your physician.

What is a Food-Drug Interaction?

A food-drug interaction happens when the food you eat affects the medicine you are taking, so the medication cannot work the way it should. Food-drug interactions can happen with both prescription and nonprescription (over-the-counter) medicines, including antacids, vitamin pills and herbal products.

Are all medications effected by food?

Not all medicines are affected by food, but many medicines can be affected by what you eat and when you eat it. If you have food in your stomach at the same time you take medication, it may delay or decrease the way a medication should act. On the other hand, some medicines are much easier to tolerate when taken with a meal or snack. You should always ask your nurse, pharmacist or physician for the best way to take your medications.

Facts to remember about food-drug interactions

- Read all directions and warnings printed on the "Patient Medication Information Sheet". This information is printed from the manufacturer of the medication, and is located within the box that the prescription came in. Even nonprescription medicines can cause problems. Ask questions if you do not understand the directions.
- Do not stir medicine into your food or take capsules apart unless instructed to do so. This may change the way a medicine works.
- Do not take vitamin pills at the same time you take other medicines.
- Do not mix medicines into hot drinks. Heat from the drink may destroy medication effectiveness.



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Analgesic Agents

ASPIRIN AND NONSTEROIDAL ANTI-INFLAMMATORY AGENTS (NSAIDS)

- Aspirin – 1, 2, 3, 4, 5
 - Ibuprofen
(Advil, Motrin, Nuprin & other various brands) – 1, 5
 - Naproxen (Aleve, Anaprox, Naprosyn) – 1, 5
1. Take with food.
 2. Have adequate fluid intake.
 3. Increase foods high in Vitamin C & folate.
 4. Avoid and/or limit supplements – ginger, garlic or ginkgo.
 5. Avoid alcohol.

NARCOTIC ANALGESICS

- Codeine – 1, 5
 - Dilaudid – 1, 2, 5
 - Morphine – 1, 2, 5
 - Demerol – 5
 - Darvon – 1, 5
 - Lortab, Percocet, Vicodin ES, Lorcet – 1, 5
 - Percodan – 1, 2, 4, 5
1. Take with food.
 2. Have adequate fluid intake.
 3. Increase foods high in Vitamin C & folate.
 4. Avoid and/or limit supplements – ginger, garlic or ginkgo.
 5. Avoid alcohol.

Antibiotics

- Cephalosporins (Ceclor, Ceftin, Cefzil, Keflex, Vantin) – 1
 - Erythromycins (E-mycin, Erytab, EES, EryC, Biaxin, Zithromax) – 1, 6, 7, 8
 - Penicillins (PenG, Pentids, PenVK, Ampicillin, Dycill, Dynapen) – 2
 - Quinolones (Avelox, Cipro, Floxin, Levaquin, Noroxin) – 1, 3, 4, 5, 6
 - Tetracyclines (Doxycycline, Sumycin, Vibramycin) – 1, 3, 5
 - Metronidazole (Flagyl) – 1, 7
 - Nitrofurantoin (Macrobid, Macrochantin) – 1, 5
 - Trimethoprim with sulfamethoxazole (Bactrim/Barctrim DS, Septra/SeptraDS) – 1, 6, 7, 9
 - Linzolid (Zyvox) – 10
1. May take with food.
 2. Take on an empty stomach, 1 hour before or 2 hours after meals.
 3. Avoid yogurt, milk.
 4. Avoid caffeine.
 5. Take antacids, magnesium, calcium, iron, zinc, supplements or multivitamins/minerals separately by 2 - 4 hours.
 6. Have adequate fluid intake.
 7. Avoid alcohol.
 8. Caution with grapefruit/grapefruit juice.
 9. Avoid coumadin, contact physician for advice.
 9. Avoid foods high in tyramine (See Dietary Guidelines).

Anticoagulants

- Cilostazol (Pletal) – 3, 9
 - Clopidogrel (Plavix) – 3, 9
 - Warfarin (Coumadin) – 1, 2, 3, 4, 5, 8, 9
 - Ticlopidine (Ticlid) – 6, 7, 9
 - Pentoxifylline (Trental) – 6, 9
1. Consistent Vitamin K (See Dietary Guidelines) consumption.
 2. Caution with Vitamin C supplements – may decrease drug absorption.
 3. Avoid/limit supplements such as garlic, ginger, ginseng, ginkgo, horse chestnut or coenzyme Q 10.
 4. Avoid avocados.
 5. Caution with alcohol.
 6. Take with food.
 7. Take magnesium supplements or antacids separately by more than 2 hours.
 8. Do not take with septrin/bactrim.
 9. Check with physician before using over-the-counter (OTC) medications that might contain aspirin or nonsteroidal agents.

Cardiovascular Agents

ACE INHIBITORS

- Altace, Benzapril (Lotensin) – 1, 4, 5, 6, 7, 8
- Enalapril (Vasotec) – 1, 4, 5, 6, 7, 8
- Lisinopril (Prinivil) – 1, 4, 5, 6, 7, 8
- Captopril (Capoten) – 2, 5, 6, 7, 8
- Fosinopril (Monopril) – 1, 4, 5, 6, 7, 8, 9, 10
- Quinapril (Accupril) – 4, 5, 6, 7, 8

CALCIUM CHANNEL BLOCKERS

- Nifedipine (Adalat, Procardia), Cardene – 2, 3, 7
- Verapamil (Calan, Isoptin) – 1, 3, 4, 7, 13
- Diltiazem (Cardizem, Dilacor, Tiazac) – 2, 3, 4, 7

OTHER

- Amiodarone (Cordarone) – 3, 17
- Carvedilol (Coreg) – 1
- Digoxin (Lanoxin, Digitek) – 9, 14, 15, 16, 17
- Labetalol (Trandate) – 1, 7
- Metoprolol (Lopressor, Toprol) – 1, 7
- Propranolol (Inderal) – 1, 7
- Nitrates (Imdur, ISMO, Isordil, Nitrocap, Sorbitrate) – 7
- Quinidine (Cardioquin, Duraquin, Quinaglute, Quinidex, Quinora) – 1, 2, 8

1. May take with food.
2. Take on an empty stomach, 1 hour before meals.
3. Caution with/avoid grapefruit or grapefruit juice 2 hours before or after dose.
4. Watch sodium intake.
5. Avoid salt substitutes. Caution with potassium supplements.
6. Avoid natural licorice.
7. Avoid alcohol.
8. Adequate fluid intake.
9. Take magnesium supplements separately by 2 hours.
10. Take calcium supplements separately by 2 hours.
11. Caution with calcium and/or vitamin D supplements.
12. Watch fat intake.
13. Limit caffeine.
14. Take separately from high fiber/pectin foods.
15. Maintain high potassium, low sodium diet along with adequate magnesium and calcium.
16. Caution with the following herbal products: aloe, foxglove and hawthorn.
17. Avoid St. John's Wort.

Diuretics

POTASSIUM DEPLETING

- Bumetanide (Bumex) – 1, 2, 3, 4, 5
- Furosemide (Lasix), Torsemide (Demadex) – 1, 2, 3, 4, 5

POTASSIUM SPARING

- Spironolactone (Aldactone) – 1, 2, 3, 5, 6
- Dyazide, Maxide – 1, 2, 3, 5, 6, 7

1. May take with food.
2. Caution with alcohol.
3. Watch sodium intake.
4. May need to increase potassium and magnesium containing foods.
5. Avoid natural licorice.
6. Avoid excessive potassium intake, potassium supplements, salt substitutes.
7. Caution with calcium and/or Vitamin D supplements.

Gastrointestinal Agents

- Diphenoxylate (Lomotil) – 1, 6
- Metoclopramide (Reglan) – 2, 6
- Cimetidine (Tagamet) – 1, 3, 4, 5, 6
- Omeprazole (Prilosec) – 2
- Pantoprazole (Protonix) – 2
- Lansoprazole (Prevacid) – 2
- Esomeprazole (Nexium) – 2
- Laxatives (Colace, Metamucil) – 7

1. May take with food.
2. Take 30 minutes before meals or at bedtime as directed.
3. May need a bland diet.
4. Take iron supplements at least one hour before drug.
5. Take magnesium supplements or antacids separately by 1 hour.
6. Avoid alcohol.
7. Consume a high fiber diet with 6-8 cups of water a day.

Anti-Diabetic Agents

- Rosiglitazone (Avandia) – 7, 8
- Pioglitazone (Actos) – 7, 8
- Glipizide (Glucotrol, Glucotrol XL) – 1, 2, 8
- Glyburide (DiaBeta, Micronase) – 1, 3, 8
- Micronized, Glyburide (Glynase) – 1, 3, 8
- Metformin (Glucophage, Glucophage XR) – 1, 3, 6, 8
- Glimepiride (Amaryl) – 1, 3, 8
- Repaglinide (Prandin) – 4, 8
- Nateglinide (Starlix) – 4, 8
- Acarbose (Precose) – 5, 8
- Miglitol (Glyset) – 5, 8
- Glyburide + metformin (Glucovance) – 1, 3, 6, 8
- Glipizide + metformin (Metaglip) – 1, 2, 6, 8
- Avandia + metformin (Avandamet) – 1, 3, 6, 8
- Avandia + Amaryl (Avandaryl) – 1, 3, 7, 8
- Actos + Metformin (Actoplus Met) – 1, 3, 6, 7, 8

1. Avoid alcohol.
2. Take 30 minutes before eating.
3. Take with meals or just before meals as ordered by your physician.
4. Take 15-30 minutes before meals (do not take medication if meal is skipped).
5. Take with the first bite of food at each main meal.
6. May decrease absorption of Vitamin B12.
7. Caution with herbal supplements.
8. Avoid licorice.

Monoamine Oxidase Inhibitors

- Phenelzine (Nardil) – 1, 2, 3, 4, 5
- Tranylcypromine sulfate (Parnate) – 1, 2, 3, 4, 5

1. Avoid foods high in tyramine and other pressor amines (See Dietary Guidelines).
2. Avoid tryptophan supplements.
3. Avoid St. John's wort and ginseng.
4. Limit caffeine.
5. Avoid alcohol.

Parkinson's Drugs

- Rasagiline (azilect) – 1

1. Avoid foods high in tyramine and other pressor amines (See Dietary Guidelines).

Minerals

- Iron (Ferrous sulfate, Fergon, Feosol, Niferex, other brands) – 1, 2, 3, 4, 5, 6, 7
- Potassium Chloride (K-Dur, Micro-K, Kaon, K-lyte) – 8, 9

1. Take with 8 ounces water or juice on empty stomach.
2. May take with food but will decrease absorption by 50%.
3. Take 1 hour before or 2 hours after eating bran, high phytate foods (See Dietary Guidelines), fiber, supplements, tea, coffee, red grape juice/wine, soy, dairy products or egg.
4. Vitamin C will increase absorption.
5. Meat increases absorption.
6. Take carbonate antacids, calcium, phosphorus, zinc or copper supplements separately by 2 hours.
7. Avoid alcohol.
8. Avoid salt substitutes.
9. Take with food.

Respiratory Agents

- Albuterol (Proventil, Ventolin) – 1, 2
- Theophylline (TheoDur, Slo-Bid, other brands) – 1, 2, 3, 4

1. May take with food.
2. Limit caffeine.
3. Avoid alcohol.
4. Consistent intake of protein/carbohydrate for consistent drug levels. Avoid drastic changes in caffeine intake.

Anti-anxiety Agents

- Alprazolam (Xanax) – 1, 2, 3, 4
- Diazepam (Valium) – 1, 2, 3, 4, 5
- Lorazepam (Ativan) – 1, 2, 3, 4

1. May take with food or water.
2. Limit caffeine.
3. Caution with herbal products.
4. Avoid alcohol.
5. Caution with grapefruit juice.

Anti-depressant Agents

- Amitriptyline (Elavil) – 1, 2, 3, 4, 6
- Fluoxetine (Prozac) – 1 (in a.m.), 4, 5, 6
- Paroxetine (Paxil) – 1, 4, 5, 6
- Sertraline (Zoloft) – 4, 6, 7

1. May take with food.
2. Increase fiber foods may decrease drug affect.
3. Limit caffeine.
4. Avoid St. John's wort.
5. Avoid tryptophan supplement.
6. Avoid alcohol.
7. Take consistently with or without food.

Lipid Lowering Agents

- Atorvastatin (Lipitor) – 1, 2, 3, 4
- Fluvastatin (Lescol) – 1, 2, 4
- Pravastatin (Pravachol) – 1, 2, 4
- Rosuvastatin (Crestor) – 1, 2, 4
- Simvastatin (Zocor) – 1, 2, 3, 4
- Gemfibrozil (Lopid) – 4, 5, 6

1. Follow low fat, low cholesterol diet.
2. Avoid grapefruit/grapefruit juice.
3. Avoid St. John's wort supplements.
4. Limit alcohol.
5. Follow low fat, low sugar diet.
6. Take 1/2 hour before breakfast and supper or as directed by your physician.

Miscellaneous Agents

- Alendronate D (Fosamax D) – 1, 2, 4, 16
- Alendronate (Fosamax) – 1, 2, 3, 4
- Risedronate (Actonel) – 1, 2, 3, 4
- Ibandronate Sodium (Boniva) – 1, 2, 3, 4

ANTI-HISTAMINE AGENTS

- Diphenhydramine (Benadryl) – 5, 6
- Barbiturates (Phenobarbital) – 3, 6, 7
- Carbidopa/Levodopa (Sinemet) – 8, 9

CORTICOSTEROID AGENTS

- Prednisone – 5, 6, 10, 11, 12
- Dexamethasone (Decadron) – 9, 10, 11, 12
- Lithium – 12, 13, 14, 15

1. Take 1/2 hour before meals/food with 6 to 8 ounces of water (best if taken two hours before food).
2. Do not lie down for 30 minutes after medication is taken.
3. Consume adequate calcium and Vitamin D.
4. Limit alcohol.
5. May take with food.
6. Avoid alcohol.
7. Limit caffeine.
8. May take with low protein foods or juice, not with high protein foods.
9. Take iron supplement separately.
10. Limit foods high in sodium.
11. May need foods high in potassium, vitamin A, C, D, Phosphorus and Calcium.
12. Take with food.
13. Consume a consistent amount of sodium.
14. Avoid iodine supplements.
15. Consume adequate fluid (2-3 liters/day).
16. Consume adequate calcium.

Dietary Guidelines

FOODS CONTAINING HIGH AMOUNTS OF VITAMIN K

- Spinach
- Kale
- Mustard greens
- Broccoli
- Brussels sprouts
- Lettuce, green leaf
- Endive
- Lettuce, romaine
- Soybeans
- Asparagus
- Kiwi fruit
- Peas
- Blueberries
- Cabbage
- Cashews
- Cauliflower

FOODS CONTAINING HIGH AMOUNTS OF TYRAMINE

Foods that should be avoided

- Aged cheese
- Any outdated or nonpasteurized dairy product
- Protein dietary supplements
- Aged, Smoked or Pickled meats, fish, poultry, sausages (including lunch meats and hot dogs)
- Leftover foods containing meat, fish or poultry
- Any overripe, spoiled or fermented fruit or vegetables
- Fava or Broad beans
- Avocados
- Sauerkraut
- Meat bouillons and gravies
- Yeast supplements, meat extracts, soy sauce
- Tap Beer (alcohol and wines may provoke an adverse reaction)
- Herbal Teas (may interfere with medications or contain tyramine)

HIGH PHYTATE (PHYTIC ACID) FOOD SOURCES

- Almonds
- Barley, whole grain
- Brazil nuts
- Cereal (All Bran, Shredded Wheat, wheat flakes, oatmeal)
- Cocoa, dry powder
- Coconut, raw
- Corn chips
- Hazelnuts
- Peanuts
- Peanut butter
- Rye bread
- Soybean meal
- Soybean protein concentrate
- Soybean protein isolate
- Walnuts
- Wheat bran

FOODS CONTAINING HIGH AMOUNTS OF POTASSIUM

- Grapefruit juice
- White beans
- Baked potato, with skin
- Lima beans
- Baked squash
- Yogurt
- Banana
- Papaya
- Artichoke
- Dates
- Tomato juice
- Rutabaga
- Potato, boiled
- Orange
- Raisins
- Apricot

YOUR NOTES:

For assistance or additional information on medications:

1. Mercy Hospital Inpatient Pharmacy 810/985-1480
2. Mercy Hospital Outpatient Pharmacy 810/966-3140
3. Mercy Hospital Outpatient Pharmacy (Mercy Health Center) 810/966-7484

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