ADVERSE INTERACTIONS

sources: www.hillphysicians.com/Your_Health/Health_Library/Interaction_by_Herb.aspx#s

Rating: 1 - significant interaction
2 - possibly significant interaction
3 - interaction of relatively little significance
4 - reported interaction that does not, in fact, exist or is significant

5 HTP (hydroxytryptophan) - LEVODOPA/CARBIDOPA *2*
Taking 5HTP and Carbidoa together might cause a scleroderma like syndrome. Development is from 2 factors: elevated plasma serotonin and abnormality associated with elevated kynurenine. Tryptophan is a precursor of 5HTP which in turn is converted into serotonin. The combo of 5HTP and carbidopa is sometimes used as treatment for intention myoclonus, has also been associated with such syndromes.

ACE INHIBITORS - POTASSIUM *2*
Related drugs: Benazepril Captopril Enalapril Fosinopril Lisinopril Quinapril Ramipril

Combining potassium with ACE inhibitors may cause too much potassium (hyperkalemia). ACE inhibitor induced reduction of angiotensin II levels diminishes aldosterone secretion, causing potassium retention. Symptoms include cardiac arrhythmias, muscle weakness, nausea, vomiting, irritability, diarrhea.

Ace inhibitors such as captopril and enalapril collectively deplete the body of zinc.

ACETAMINOPHEN
Common names: 11 AF, Abenol, Acetab, Acet, Alisphene Forte, Alvedon, Anadin Paracetamol, APAP, Apo Acetaminophen, Artritol, Atasol, Boots Children's Pain Relief Syrup, Boots Cold Relief Hot Blackcurrant, Boots Cold Relief Hot lemon.....
Combination drugs: Alka Seltzer Plus, Co-Proxamol, Coalgesic, Excedrin PM, Nyquil, Tyenol Allergy Sinus, Tylenol Cold, Tylenol Flu Night Time....
Acetaminophen is used to reduce pain and fever. Unlike NSAIDs (nonsteroidal anti inflammatory drugs), it lacks anti-inflammatory activity. Acetaminophen is available by itself or in non-prescription and prescription only combination products used to relieve pain and the symptoms associated with colds and flu.

N acetyl cysteine

Hospitals use oral and intravenous N acetyl cysteine (NAC) to treat liver damage induced by acetaminophen overdose poisoning. NAC is often administered intravenously by emergency room doctors. Oral NAC appears to be effective for acetaminophen toxicity.
An uncontrolled trial compared intravenous NAC with oral NAC in children with acetaminophen poisoning and found that both methods were equally effective in reversing acetaminophen induced liver toxicity. However, acetaminophen toxicity is a potential medical emergency, and should only be managed by qualified health care professionals.

Vitamin C

Taking 3 grams Vit. C with acetaminophen has been shown to prolong the amount of time acetaminophen stays in the body. You may be able to use less acetaminophen, thereby reducing risk of side effects. Consult with doctor. High doses Vit. C will cause absorption of too much iron. Risk of liver damage from high doses of acetaminophen may be increased with large doses Vit. C

Hibiscus.

One small study found hibiscus could decrease levels of acetaminophen if the drug was taken

after the tea was consumed though it was not entirely clear if the decreases were clinically significant.

Methionine

Toxicity of ingesting acetaminophen is ameliorated by methionine sulfoxide.

Milk Thistle

Silymarin is a collection of complex flavonoids found in milk thistle that has been shown to elevate liver glutathione levels in rats. Acetaminophen can cause liver damage which is believed to involve glutathione depletion. In one study involving rats, silymarin protected against acetaminophen induced glutathione depletion.

While studies to confirm this action in humans have not been conducted, some doctors recommend silymarin supplementation with 200 mg milk thistle, extract, containing 70-80% silymarin, three times per day for people taking acetaminophen in large amounts for more than 1 year and/or with other risk factors for liver problems.

Schisandra (Schisandra chinesis)

Gomisin A is a constituent found in the Chinese herb schisandra. In a study of rats given liver damaging amounts of acetaminophen, gomisin A appeared to protect against some liver damage but did not prevent glutathione depletion (unlike milk thistle). Studies have not yet confirmed this action in humans.

Food

Food, esp. foods high in pectin including jellies, carbohydrates and large amounts of cruciferous vegetables (broccoli, brussel sprouts, cabbage, et al) can interfere with acetimophen absorption. It is unclear how much effect this interaction has on acetaminophen activity.

Alcohol

Moderate to high amounts of acetaminophen have caused liver damage in people with alcoholism. To prevent problems, people taking acetaminiophen should avoid alcoho.'

ACETAMINOPHEN - VITAMIN C *3*

Very high doses of Vit. C (3 g daily) might impair metabolism of acetaminophen, potentially increasing serum levels. Ascorbic acid competively inhibits the hepatic metabolism of acetaminophen to the inactive sulfate metabolite, thus decreating the excretion rate of this fraction. However the liver metabolizes most acetaminophen to the inactive glucuronide metabolite. If metabolism to the sulfate metabolite is impaired, a compensatory mechanism might increase the fractions of acetaminophen glucuronide as well as unchanged drug excreted. Although these two processes partially offset each other, it is possible the net effect will be reduced acetaminophen excretion. Probably not significant when acetaminophen is taken in a single therapeutic dose for pain and fever, but may be a problem with long term use or if the person has liver or kidney impairment.

ADAPTOGEN HERBS

Don't take with digitalis (see Digitalis). Adaptogens might (not sure) change the rate at which the liver clears stuff.

Watch Adaptogens with Heart meds or any drugs.

ALKASELTZER

Contains Aspirin, Citric Acid, Sodium bicarbonaste - see individual listings

ALKA SELTZER PLUS

Contains Acetaminophen Pseudoephedrine Chlorpheniramine - see individual listings.

ALPRAZOLAM - KAVA *2*

Related drugs:

Chlorodiazepoxide Lorazepam Chlorazepate Diazepam Oxazepam Prazepam

Concomitant use may result in central nervous system depression with accompanying sedation and drowsiness therefore concomitant use of kava with alprazolam or any of the other

benzodiazepines is not recommended.

ALUMINUM HYDROXIDE - CALCIUM CITRATE "3"
There is evidence that calcium citrate and other citrates may increase the absorption of the aluminum from antacids as well as dietary sources. Take calcium citrate apart from the aluminum containing antacids and meals.
If person has hyperphosphatemia, calcium acetate may be preferable to citrate when taken with aluminum hydroxide gel to bind phosphate, esp. in chronic renal failure patients.

AMIODARONE - CHAPARRAL *2*
Related drugs:
Androgenic steroids Fibric acids Hepatotoxic drugs Ketoconazole Niacin Statin drugs Tacrine
Chaparral may hasten onset and worsen severity of liver toxicity of known hepatotoxic drugs as above.
In some cases, liver transplant was required. If possible avoid concomitant use of chaparral with any known hepatotoxin.

ANTACIDS
May reduce absorption of copper and phosphate.
May reduce absorption of ACE inhibitors
Antacids that contain magnesium and aluminum salts reduce the absorption of rufloxacin.
Antacids may reduce zinc and iron absorption due to the inhibition of gastric acid secretion.

ANTI-CONVULSANTS
You should not drink grapefruit juice.
Do not combine kava-kava (sedative) with drugs such as Xanax .
Oregon grape, Passion Flower, Gotu Kola (sedative and anticonvulsant, do not take with anti-convulsants.
Anti-convulsants may deplete Folic acid. Suggest supplementation of Vit.D
Carnitine may be helpful. Biotin helpful but take at a different time of the day.
Avoid Vit. A, Glutamine, White Willow, Gingko, St. John's Wort, Dong Quai.

ANTIPSYCHOTIC DRUGS
Not with Phosphatidylserine. Phosphatidylserine may have a synergistic effect on the anticoagulant action of medications such as heparin.
Phosphatidylserine levels may increase dramatically when used with antipsychotic drugs.

ANTIVIRAL DRUGS
Antiviral drugs are used to treat diseases caused by viruses like AIDS, genital herpes, influenza, chickenpox, shingles, cold sores.

ARGININE
- **L-arginine may also alter potassium levels, especially in people with liver disease. People with kidney disease and those who take ACE inhibitors or potassium sparing diuretics should not use supplemental L-arginine unless they are under professional supervision. It may also alter the levels of other chemicals and electrolytes in the body, such as chloride, sodium, and phosphate.**
- **L-arginine may lower blood pressure because it is involved in the formation of nitric oxide. It may also result in indigestion, nausea, and headache.**
- **L-arginine should not be used following a heart attack. If you have a history of heart disease, consult your doctor before taking L-arginine.**
- **Higher doses of arginine can increase stomach acid, so it may worsen heartburn, ulcers, or digestive upset cause by medications. Arginine appears to increase stomach acid by stimulating the production of gastrin, a hormone that increases stomach acid.**
- **Arginine may increase blood sugar levels, so it shouldn't be used by people with diabetes unless under a doctor's supervision.**

- **L-arginine may counteract the benefits of lysine to treat herpes**
- **NSAIDS (non-steroidal anti-inflammatories) or other drugs that are hard on the stomach should not be combined with L-arginine.**
- **Drugs that alter potassium levels in the body, such as ACE inhibitors and potassium sparing diuretics.**

ASPIRIN - FISH OIL *4*

- **Fish oil (source of omega 3 fatty acids) has eicosanoid-modifying effects. First it was thought to increase risk of bleeding complications, however a study showed this did not happen. Then there was accumulating evidence suggesting fish oil did increase the risk of bleeding complications when taken by itself. In a large double blindstudy, it showed no increased risk and therefore can be consumed safely with aspirin.**

ASPIRIN - POLICOSANOL *2*

Related drugs (NSAIDS)

Bromfenac	Diclofenac	Etodalac	Fenoprofen	Flurbiprofen	Ibuprofen
Indomethacin	Ketoprofen	Ketorolac	Meclofenamate	Mefenamic acid	
Nabumetone	Naproxen	Oxaprozin	Piroxicam	Sulindac	
Tolmetin					

Other drugs:

Abciximab	Anagrelide	Cilostazol	Clopidogrel
Dipyridamole	Eptifibatide	Pentoxifylline	Ticlopidine
Tirofiban			

Other potentially implicated supplements:

Feverfew	Ginger	Saw Palmeto	White Willow

Policosanol has antiplatelet actions that might potentiate the anticoagulant effect of aspirin and other antiplatelet agents. Saw palmetto has been associated with significantly increased bleeding time and intraoperative hemorrhage in one study.

White willow contains salicylates. Feverfew and ginger are known to affect platelet aggregation although clinical findings are unclear.

Human trials found policosanol used for hyperlipidemia, exhibited dose dependent antiplatelet actions. This was comparable to aspirin, which combined there was an additive effect.

A double blind study of those with hypercholesterolemia found taking 10mg policosanol a day reduced platelet aggregation induced by collagen, low dose ADP or arachidonic acid. Other studies suggest that taking policosanol and aspirin together may need medical supervision.

ASPIRIN - VITAMIN E *2*

Related drugs (NSAIDS)

Bromfenac	Diclofenac	Etodalac	Fenoprofen	Flurbiprofen	Ibuprofen
Indomethacin	Ketoprofen	Ketorolac	Meclofenamate	Mefenamic acid	
Nabumetone	Naproxen	Oxaprozin	Piroxicam	Sulindac	
Tolmetin					

Other drugs:

Abciximab	Anagrelide	Cilostazol	Clopidogrel
Dipyridamole	Eptifibatide	Pentoxifylline	Ticlopidine
Tirofiban			

Other potentially implicated supplements:

Aortic glycosaminoglycans	Bromelain	Oligomeric proanthocyanidin complexes

Vit. E appears to add to aspirin's antithrombotic effects - might be more effective when taken together to prevent transient ischemic attacks, strokes from blood clotting. However might also increase the risk of hemorrhagic strokes and abnormal bleeding episodes.

Vit. E has been shown to inhibit platelet aggregation in vitro.

ASTHMA INHALERS (Albuterol, Salmeterol, Epinephrine)
The following foods, high in tyramine, may interfere with these sympathomimetic drugs (mostly protein such as meat, fish, dairy that has been sitting around for too long will start to form tyramines eg. leftovers)

Aged Cheeses	Aged dairy (esp. sour cream)	Avocado
Beef & chicken liver	Chocolate	Dried & pickled fish
Hydrolyzed veg. protein	Wine beer, liquers, champagne	Raisins
Tomatoes	Yeast	

Soy products such as tofu, miso, soy sauce, teriyaki sauce
Sausages, pepperoni, salami, bologna
An inhaler dose after a bologna sandwich for an asthmatic child good cause a serious interaction.

AZT
Common names:

Apo-Zidovudine	Azidothymidine	Novo-AZT	
Retrovir	ZDV	Zidovudine	

Combivir (combination drug)

- **AZT inhibits reproduction of retroviruses including HIV. HIV is considered the cause of AIDS.**
- **AZT is one of a number of drugs used to treat HIV infection and AIDS**
- **AZT therapy may cause reduction in copper and zinc blood levels. Animal studies suggest that**
- **Vit. E may improve efficacy of AZT.**
- **Carnitine**
- **The muscle damage sometimes caused by AZT is at least partially due to depletion of carnitine in the muscles by the drug. Take 6 grams a day to restore N-acetyl cysteine**
- **Animal research suggests zinc and N acetyl cysteine may protect against AZT toxicity. Unknown whether oral supplementation with these nutrients would have similar effects in people taking AZT.**
- **Vit. B12 deficiency in HIV infected persons may be more common in those taking AZT.**
- **Riboflavin**
- **Those with AIDS develop lactic acidosis and fatty liver while taking AZT and other drugs in this class. AZT can inhibit crucial DNA related riboflavin activity which may e normalized by riboflavin supplementation.**
- **Thymopertin**
- **Thymopentin is a small protein that comes from a natural hormone in the body known as thymopoietin. This hormone stimulates production of the white blood cells known as T**
- **lymphocytes. Combining this with AZT tended to decrease the rate at which HIV infectedpersons progressed to AIDS. Thymopentin alone didn't seem to have a benefit in this study.**
- **Thymopentin is given by injections into the skin.**
- **Zinc**
- **Adding 100 mg zinc a day to AZT treatment decreased the number of Pneumocystis carinii pneumonia and Candida infections in people with AIDS compared with people treated with AZT alone. Zinc also improved weight and CD4 cell levels. Amount of zinc used in this study was very high and should be combined with 1-2 mg of copper to reduce risk of immune problems from the zinc long term.**

BARBITURATES
Related drugs:

Aluratec	Amobarbital	Amylbarbitone	Amytal
Aprobarbital	Brevital	Busodium	Butabarbital
Butisol	Mebaral	Mephobarbital	Metharbital
Methohexital	Nembutal	Pentobarbital	Pentothal

Phenobarbitone	**Quinalbrbitone**	**Secobarbital**	**Seconal Sodium**
Seconal	**Sodium Pentothal**	**Soneryl**	**Talbutal**
Thiamylal	**Thiopental**	**Tuinal**	

- **Barbiturates are a family of drugs that depress nerve activity in the brain which produces changes in mental activity ranging from mild sedation and sleep, to deep coma. They are used to treat anxiety, insomnia, seizure disorders, migraines. In addition some barbiturates are used in surgery as good anesthetics.**
- **Avoid alcohol which increases the side effects of drowsiness, confusion, dizziness. If taken in excess, this combination can result in death.**

BETA-AGONISTS
Including:

- **Albuterol (Proventil, Ventolin, Repetabls, Volmax, Airet)**
- **Bitolterol Mesylate (Tornalate)**
- **Isoetharine (Arm-a-med Isoetharine, Beta-2, Bronkosol)**
- **Isoproterenol (Isuprel Glossets, Isuprel, Medihaler-Iso, Dispos-a-Med)**
- **Levalbuterol (Xopenex)**
- **Metaproterenol Sulfate (Alupent, Metaprel)**
- **Pirbuterol Acetate (Maxair Inhaler, Maxair Autohaler)**
- **Terbutaline Sulfate (Brethine, Bricanyl)**
- **These inhibit the release of histamine from mast cells in the airways to increase the movement of the tiny cilia that help to propel allergens out of the lungs, reversing the constriction of bronchial tubes during asthma attacks.**
- **The following foods, high in tyramine, may interfere with these sympathomimetic drugs (mostly protein such as meat, fish, dairy that has been sitting around for too long will start to form tyramines eg. leftovers)**

Aged Cheeses	**Aged dairy (esp. sour cream)**	**Avocado**
Beef & chicken liver	**Chocolate**	**Dried & pickled fish**
Hydrolyzed veg. protein	**Wine beer, liquers, champagne**	**Raisins**
Tomatoes	**Yeast**	

Soy products such as tofu, miso, soy sauce, teriyaki sauce
Sausages, pepperoni, salami, bologna

- **An inhaler dose after a bologna sandwich for an asthmatic child good cause a serious interaction.**

BETA-ADRENERGIC BLOCKERS
Related drugs:

Betagan	**Breviblock**	**Carteolol**	**Cartrol**
Celectol	**Celliprolol**	**Esmolol**	**Levatol**
Levobunolol	**Metipranolol**	**Nebilet**	**Nebivolol**
Ocupress	**OptiPranolol**	**Oxprenolol**	**Penbutolol**
Pindolol	**Slow-Trasicor**	**Transicor**	**Visken**

- **Beta-adrenergic blockers or 'beta blockers' are a family of drugs used to treat high blood pressure, angina, heart arrhythmia, tremors, alcohol withdrawal, glaucoma, other conditions.**
- **They are also used to prevent migraine headaches, stage fright, second heart attacks.**
- **Interactions that are common to all beta-adrenergic blockers are described below. For interactions with specific beta-adrenergic blocker refer to:**

Acebutolol	**Atenolol**	**Betaxolol**	**Bisoprolol**
Labetalol	**Metoprolol**	**Nadolol**	**Propranolol**
Sotalol	**Timolol**		

Opthalmic forms: Betaxolol Carteolol Levobunolol Metipranolol Timolol

Potassium

- **Some beta adrenergic blockers (called 'non-selective' beta blockers' decrease the uptake of potassium from the blood into the cells, leading to excess potassium in the blood, potentially dangerous condition called hyperkalemia. People taking beta blockers should avoid taking potassium supplements or eating large quantities of fruit: bananas until doctor says differently.**

Pleurisy Root

- **Pleurisy root and other plants in the Aesclepius genus contain contain cardiac glycosides. Best**
- **to avoid.**

BETA BLOCKERS - CALCIUM *4*

Related Drugs

Acebutolol	**Atenolol**	**Betaxolol**	**Bisoprolol**	**Carteolol**	**Esmolol**
Metoprolol	**Nadolol**	**Penbutolol**	**Pindolol**	**Propranolol**	**Sotalol Timolol**

- **Calcium may decrease blood levels of the beta blocker atenolol and possibly other beta blockers although the clinical effects appear to be minimal after several doses.**

- **500mg Calcium (lactate, gluconate, and carbonate) was given with atenolol (100mg) for 6 days and decreased mean peak plasma levels (Cmax) of atenolol by 51%. 12 hr after tacycardia was only 10% compared to 21% taking atenolol alone.**
- **No dosage adjustment necessary when atenolol is taken with calcium over the long term. Severe coronary artery disease should be given 2X the normal dose of atenolol on the first day if giving calcium also.**

BILE ACID SEQUESTRANTS

RElated drugs:

Alti Cholestyramine	**Anion-ExchangeResins**	**Cholestyramine**	**Colestyramine**
Novo-Cholamine	**PMS Cholestyramine**	**Prevalite**	**Questran**

- **Cholestyramine (Questran) and colestipol (Colestid) are bile acid sequestrants - a class of drugs that binds bile acids, prevents their reabsorption from the digestive system and reduces cholesterol levels. Cholestyramine and colestipol are two of many drugs used to lower cholesterol levels in those with high cholesterol.**
- **Bile acids are produced in the liver from cholesterol and secreted into the small intestine to help with the absorption of dietary fat and cholesterol. Bile acid sequestrants bind bile acids in the small intestine and carry them out of the body. This causes the body to use more cholesterol to make more bile acids, which are secreted into the small intestine, bound to bile acid sequestrants and carried out of the body. The end result is lower cholesterol levels. Bile acid sequestrants also prevent absorption of some dietary cholesterol.**
- **The information herein pertains to bile acid sequestrants in general. The interactions reported here may not apply to all the Also Indexed As terms.**

Vitamins & Minerals

- **Bile acid sequestrants may prevent absorption of folic acid and the fat soluble vitamins A, D, E and K. Other medications and vitamin supplements should be take one hour before or four to six hours after bile acid sequestrants for optimal absorption. Animal studies suggest calcium and zinc may also be depleted by taking cholestyramine.**

Carotenoids

- **Use of colestipol for 6 months has been shown to significantly lower blood levels of carotenoids including beta carotene.**

Food
Bile acid sequestrants should be taken with plenty of water, before meals.

BIOTIN - CARBAMAZEPINE *3*
Related drugs:
Phenoarbital Phenytoin Primidone Valproic acid

- **Carbamazepine may deplete biotin, possibly by competing with it for absorption in the intestine.**
- **Not clear if this is a problem. Valproate may affect biotin to a lesser extent than the other anticonvulsants. Suggesting supplement with biotin if on long term anticonvulsant therapy and take 2-3 hours apart from the drug.**

BLOOD THINNERS (coumadin, aspirin)
Avoid Vit. E, Pau D'arco, Gingko,

BROMOCRIPTINE - CHASTEBERRY *2*
Related drugs:

Amantadine	**Chloropromazine**	**Fluphenazine**	**Levodopa**	**Loxapine**
Mexoridazine	**Metoclopramide**	**Molidone**	**Pergolide**	**Perphenazine**
Pimozide	**Pramipexole**	**Prochlorperazine**	**Promazine**	**Ropinirole**
Thioridazine	**Thiothixene**	**Trifluoperazine**	**Triflupromazine**	

- **The ability of chasteberry (vitex) to inhibit prolactin release may autment bromocriptine's prolactin-inhibitory effects. Similar interaction noted with dopamine agonists like amantadine, levodopa, pergolide, pramipexole and ropinirole. Dopamine may lessen effectiveness of chasteberry. Suggest not using together.**

CAFFEINE
Related drugs:

Cafcit	**Caffedrine**	**Enerjets**	**No Doz**
Quick Pep	**Snap Back**	**Stay Alert**	**Vivarin**

Combination drugs: Anacin Darvon Compound Floriet Fiorinal

- **Caffeine is a central nervous system stimulant drug used as an aid to stay awake for mental alertness due to fatigue and as an adjunct with other drugs for pain relief.**

Calcium
- **In 205 healthy postmenopausal women, caffeine consumption (3 cups coffee a day) was**
- **associated with bone loss in women with calcium intake of less than 800 mg a day. In a group of 980 postmenopausal women, lifetime caffeine intake equal to 2 cups coffee a day was associated with decreased bone density in thsoe who did not drink at least one glass of milk daily during most of their lie.**
- **In 138 healthy postmenopausal women, long term dietary caffeine (coffee) intake was not associated with bone density.**

Guarana (Paullinia cupana)
- **This is a plant with high caffeine content. Combining caffeine drug products and guarana increases caffeine induced side effects.**

Ephedra
- **Used as weight loss and for quick energy. Combined with caffeine or caffeine containing products, the combination may lead to dangerously increasing heart rate and blood pressure.**
- **Avoid if heart condition, hypertension, diabetes or thyroid disease.**

Food
- **Caffeine is found in coffee, tea, soft drinks, chocolate. To reduce side effects, avoid these foods**

if you are taking caffeine containing drug products.

Tobacco

- **Smoking can increase caffeine metabolism, decreasing effectiveness. Smokers who use caffeine containing drug products may require higher amounts of caffeine to achieve effectiveness.**

CALCIUM-CHANNEL BLOCKERS

Bepadin, Bepridil, Cardene SR, Cardene, DynaCirc, Isradipine, Lacidipine, Lercanidipine, Motens, Nicardipine, Nimodipine, Nimotop, Nisoldipine, Prescal, Sular, Syscor MR, Vascor, Zanidip.

- **Calcium channel blockers are a family of drugs used to treat angina, high blood pressure, heart arrhythmia, heart failure and Raynauds disease as well as to prevent migraine headaches.**
- **See specific interactions for: Amlodipine Diltiazem Felodipine Nifedipine Verapamil**
- **Pleurisy root and others in the Aesclepius genus contain cardiac glycosides, best to avoid with the medications.**

CALCIUM - CORTICOSTEROIDS *2*

Related Drugs:

Betamethasone	**Corticotropin**	**Cortisone**	**Cosyntropin**	**Dexamethasone**
Fludrocortisone	**Hydrocortisone**	**Methylprednisolone**		**Prednisolone**
Prednisone	**Triamcinolone**			

Other potentially implicated supplements:

Vitamin D

- **Corticosteroid use cause osteoporosis by decreasing intestinal absorptionof calcium.**
- **Supplementing with Vit. D and Calcium may help prevent bone loss due to long term use of the drug. Vit.D however may increase risks of hypercalciuria & hypercalcemia (presence of excess calcium in the urine which can lead to kidney stones) so monitor the person closely.**
- **Vit D3 (calcifediol) seems to lower the risk than calcitriol (most active form of VitD)**

CALCIUM - DIGOXIN *3*

Related drugs:

Deslanoside Digitoxin Digitalis

Digoxin may increase calcium excretion, leading to depletion. Recommend adequate amounts of calcium through diet or supplements if taking this drug.

CALCIUM PHENYTOIN *2*

Related Drugs:

Carbamazepine Phenobarbital Primidone

Carbamazepine and other anticonvulsant drugs may impair calcium absorption esp calcium carbonate - borne formation.

Take calcium and anticonvulsant drugs several hours apart.

CALCIUM - THIAZIDE DIURETICS *1*

Related drugs:

Bendroflumethiazide	**Benzthiazide**	**Chlorothiazide**	**Indapamide**	
Hydrochlorothiazide	**Hydroflumethiazide**	**Methylothiazide**		**Metolazone**
Polythiazide	**Quinethazone**	**Trichlormethiazide**		

- **Thiazide diuretics decrease urinary calcium excretion by the effect on renal tubular reabsorption. Adding supplemental calcium and possibly Vit. D may present risk of hypercalcemia (excess calcium in urine, leading to kidney stones).**
- **Alterations in intestinal calcium absorption, parathyroid hormone secretion and Vit. D metabolism may occur. If someone is taking Calcium with thiazide diuretics, monitor and watch for anorexia, polydipsia, polyuria, constipation and muscle hypotonia. If they are also taking Vit. D or have hyperparathyroidism, be careful and watch closely.**

CARBAMAZEPINE - GRAPEFRUIT JUICE *1*

Related drugs:

Astemizole *1*	**Azole antifungal agents *2***	**Benzodiazepines *3***	
Buspirone *2*	**Calcium channel blockers *1***	**Clomipramine *2***	
Cyclosporine *2*	**Estrogen *2***	**Statins *1***	**Saquinavir mesylate *1***

Other potentially implicated herbs and supplements:

Cat's claw	**Citrus bioflavonoids**	**Echinacea**	**Goldenseal**
Licorice	**St. John's wort**	**Wild Cherry**	

- **Grapefruit juice is a CYP enzyme inhibitor and slows the metabolism of numerous drugs, causing a risk of excess plasma drug levels and adverse reactions. Taking 1 glass of juice can have an effect for 3 or more days after.**

CARNITINE - VALPROIC ACID *2*

Related drugs:

Barbiturates	**Carbamazepine**	**Divalproex sodium**	**Phenobarbital**
Phenytoin	**Primidone**	**Valproate sodium**	

- **Long term therapy with valproic or other anti-convulsant agents may be associated with depressed carnitine levels.**
- **Carnitine is excreted intact by the kidneys as free carnitine or acylcarnitine with the proximal renal tubule reabsorbing more than 90% of filtered carnitine at normal physiologic concentrations. There is some evidence that valproic acid depresses the renal reabsorption of both free carnitine and acylcarnitine, although other anticonvulsants depress the renal reabsorption of acylcarnitine only so other mechanisms may also be involved.**
- **Suggest supplementing by giving oral carnitine in 3-4 divided doses for a total daily dose of 100mg/kg or 2g whichever is less.**

CARBIDOPA/LEVODOPA
Common names: Apo-Lev

CHEMOTHERAPY
May involve using several antineoplastic (anticancer) drugs. The drugs are toxic to cancer cells, and many are toxic to healthy cells, causing side effects. Some enhance immune function, some alter hormonal activity. Methotrexate is used to also treat severe cases of rheumatoid arthritis.

Alkylating agents:

Busulfan (Myleran)	**Carboplatin (Paraplatin for Injection)**
Carmustine (BiCNU for Injection)	**Chlorambucil (Leukeran)**
Cisplatin (Platinol, & for injection0	**Cyclophosphamide (Cytoxan, Neostat)**
Ifosfamide (Ifex for Injection)	**Lomustine (CeeNu)**
Mechlorethamine (Mustargen for Injection)	**Melphalan (Alkeran)**
Pipobroman (Vercyte)	**Polifeprosam 20 with Carmustine (Gliadel Wafer)**
Streptozocin (Zanosar for Injections)	**Thiotepa (Thioplex for Injection)**
Uracil Mustard	

Antineoplastic antibiotics:

Bleomycin (Blenoxane)
Daunorubicin (Cerubidine for Injection)
Doxorubicin (Adriamycin Injection,
Idarubicin (Idamycin)
Mitoxantrone
Plicamycin
Capecitabine
Cytarabine
Floxuridine
Fluorouracil
Methotrexate
Dactinomycin (Cosmegen for Injection)
DaunoXome Injection
Rubex for Injection
Mitomycin
Pentostatin
Antimetabolites:
Cladribine
Doxil Injection
Fludarabine
Mercaptopurine
Thioguanine

Hormonalangonists/antagonists:

Anastrozole	**Bicalutamide**	**Diethylstilbestrol**	**Estramustine**
Flutamide	**Goserelin**	**Leuprolide**	**Megestrol**
Nilutamide	**Tamoxifen**	**Testolactone**	**Toremifene**

Mitotic inhibitors:

Etoposide	**Teniposde**	**Vinblastine**	**Vincristine**

Immunomodulators:

Aldesleukin	**Levamisole**

Miscellaneous Antineoplastics:

Altretamine	**Asparaginase**	**Docetaxel**	**Hydroxyurea**
Interferon	**Irinotecan**	**Mitotane**	**Paclitaxel**
Procarbazine			

Antioxidants:

- **Chemotherapy can injure cancer cells by creating oxidative damage. As a result, some oncologists recommend that patients avoid supplementing antioxidants if they are undergoing chemotherapy. Test tube research occasionally supports this idea, but most scientific research does not.**
- **Vit. C appears to help chemotherapy work better in animals. Japanese research found Vit. E, C, and N acetyl cysteine (NAC), all antioxidants, protected against chemotherapy induced heart damage.**
- **A new formulation of selenium was found tor educe kidney damage and white blood cell lowering effects of cisplatin in one human study, however the level used was 4,000 mcg a day, potentially toxic so use with care.**
- **Glutathione, main antioxidant found within cells is frequently depleted in individuals on chemotherapy and/or radiation. Intravenous glutathione may decrease some of the adverse effects.**

Glutamine

- **Though cancer cells use glutamine as a fuel source, studies in humans have not found that glutamine stimulates growth of cancers in people taking chemotherapy. In fact animal studies show glutamine may actually decrease tumor growth while increasing susceptibility of cancer cells to radiation and chemotherapy, though such effects have not yet been studied in humans.**

Magnesium & Potassium

- **Some chemotherapy causes loss of magnesium & potassium in the urine. The magnesium deficiency resulted in seizures.**

Melatonin

- **High amounts of melatonin have been combined with a variety of chemotherapy drugs to reduce side effects and improve drug efficacy. One study have melatonin at night in combination with the drug triptorelin to men with metastatic prostate cancer. All of these men had previously become unresponsive to triptorelin. The combination decreased PSA levels - a marker of prostate cancer progression - in 8 of the 14 patients, decreased some side effects of triptorelin, and helped 9 of 14 to live longer than one year. The outcome of this preliminary study suggests that melatonin may improve the efficacy of triptorelin even after the drug has apparently lost effectiveness.**

N-acetyl cysteine (NAC)

- **NAC, an amino acid like supplement that possesses antioxidant activity has been used in four human studies to decrease the kidney and bladder toxicity of the chemotherapy drug ifosfamide.**
- **These studies used 1-2 grams NAC 4X/day. There was no sign that NAC interfered with the efficacy of ifosfamide in any of these studies. Intakes of NAC over 4 grams per day may cause nausea and vomiting. The newer anti-nausea drugs prescribed for people taking chemotherapy lead to greatly reduced nausea and vomiting for most people. Nonetheless, these drugs often do not totally eliminate all nausea. Natural substances used to reduce nausea should not be used instead of prescription anti-nausea drugs. Rather, under the guidance of a doctor, they should be added to those drugs if needed. One trial suggests that NAC at 1,800mg per day may reduce nausea and vomiting caused by chemo.**

Spleen extract

- **Patients with inoperable head and neck cancer were treated with spleen peptide preparation (Polyerga) in a double lind trial during chemo with cisplatin and 5 FU. The spleen preparation had a significant stabilizing effect on certain white blood cells. People taking it also experiences stabilized body weight and a reduction in the fatigue and inertia that usually accompany this combination of chemotherapy agents.**

Beta carotene and Vit. E

- **Chemo frequently causes mouth sores. In one trial, people were given approx 400,000 IU of beta carotene per day for 3 wk then 125,000 IU a day for another 4 wk. Those taking beta carotene still suffered mouth sores, but the mouth sores developed later and tended to be less severe than that formed in people receiving the same chemo without beta carotene.**
- **In another study, they applied Vit. E directly to mouth sores and had complete resolution of the sores. Not all studies agreed. Until more is known, apply Vit. E topically 2X/day, the tocopherol versus tocopheryl form.**

Vit. A

- **French trial reported in breast cancer (late stage) those who were given large amounts of Vit. A a day (350,000-500,000 IU), along with chemo, remission rates were significantly better than chemo alone. These women were post menopausal, similar results were not found in premenopausal women.**

Zinc

- **Eradication treatment, esp. of head and neck cancers, frequently result in changes in normal taste sensation. Zinc may be protective against taste alterations caused or exacerbated by irradiation. A double blind trial found 45 mg zinc sulfate TID reduced alteration of taste sensation during radiation treatment and led to better recovery of taste sensation after treatment.**

Multi Vit-Min

- **Many chemo drugs cause diarrhea, lack of appetite, vomiting, damage to gastro tract. Any**

nausea prescriptions are often helpful. Nutritional deficiencies do occur and it makes sense to take a high potency multi to protect against deficiencies.

Taurine

- **Has been shown to be depleted in chemo patients. It is unclear how important this effect is or if you should take taurine.**

L-carnitine

- **In a preliminary study, taking 2 grams L-carnitine BID for 7 days relieved chemo induced fatigue in 90% of people who had been treated with chemo drugs cisplatin or ifosamide. There was no placebo group in the study so can't rule out the possibility that the fatigue resolved spontaneously.**

Thymus peptides

- **Peptides or short proteins derived from the thymus gland has been used with chemo. One study using thymosin fraction V in comb. with chemo, found longer survival times than those with chemo alone. Thymostimulin decreased some side effects of chemotherapy, increased survival time compared to those on chemo alone. Thymic extract was shown to improve immune function of chemo treated people. Thymic peptides need to be administered by injection.**

Interactions with Herbs:

Echinacea

- **One study found the actions of cyclophosphamide, echinacea and thymus gland extracts to treat advanced cancer patients extended the life span of some that were inoperable.**

Eleuthero

- **Russian research used Eleuthro with melanoma patients taking chemo and found chemo was less toxic. Breast cancer women found chemo more tolerable.**

Milk Thistle

- **Used with cisplatin and doxorubicin in test tubes. Silymarin showed synergistic actions and offset the kidney toxicity in animals. Some evidence that silymarin may not interfere with chemo in humans with cancer.**

Ginger

- **Can be helpful in alleviating nausea and vomiting caused by chemo. Can take 500mg amounts every 2-3 hr for a total of 1 gram a day.**

German chamomile

- **Liquid preparation of German chamomile helped reduce incidence of mouth sores in those receiving radiation and systemic chemo in an uncontrolled study. When 15 drops chamomile liquid was taken in 100 ml warm water TID, radiation amount required to produce mouth sores doubled.**

Coriolus versicolor

- **This mushroom contains immune stimulating substance called polysaccharide krestin or PSK.**
- **Studies have shown PSK has helps those undergoing chemo. Women with estrogen receptor-negative breast cancer, prolonged survival time compared to who just did chemo.**
- **Another study showed the PSK + chemo group had 25% better chance of survival after 10 years etc.**

St. John's Wort

- **Administration of St. John's wort has been shown to reduce blood levels of the active form of**

anti cancer drug irinotecan. Consequently, don't take these two together.

Foods

- **Many people taking chemo develop aversions to certain foods, sometimes making it permanently difficult to eat those foods. Exposing people to "acapegoat stimulus' just before the administration of chemo can direct the food aversion to he 'scapegoat' food instead of more important parts of the diet. In one trial fruit drinks administered just before chemo were most effective in protecting against aversions to other foods.**
- **Ingesting grapefruit juice along with etoposide has been found to reduce blood levels of the drug.**
- **Studies with certain other medications suggest that grapefruit juice may affect drug availability, even if it is consumed at a different time of the day. Therefore, individuals taking etoposide should probably avoid grapefruit and grapefruit juice.**

CHROMIUM - CALCIUM CARBONATE *3)
Antacids containing calcium carbonate may reduce the absorption of chromium when the two are taken together.

CIPROFLOXACIN - FENNEL *2*
Related drugs:

Enoxacin	**Grepafloxacin**	**Lomefloxacin**	**Norfloxacin**
Ofloxacin	**Sparfloxacin**	**Trovalfloxacin**	

Fennel appears to alter ciprofloxacin bioavilability and pharmacokinetics, potentially impairing its effectiveness. Similar effects may be expected with other fluoroquinolones. Mechanism of why this interaction isn't clear, it may involve metal ions found in fennel. Take each 2 hours apart from each other.

CLOMIPRAMINE - SAMe *2*
Related drugs:

Amitriptyline	**Amoxapine**	**Citalopram**	**Desipramine**
Doxepin	**Floxetine**	**Fluvoxamine**	**Imipramine**
Isocarboxazid	**Naratriptan**	**Nefzodone**	**Nortriptyline**
Paroxetine	**Phenelzine**	**Protroptyline**	**Rizatriptan**
Sertraline	**Sumatriptain**	**Tramadol**	**Tranylcypromine**
Trimipramine	**Venlafaxine**	**Zolmitriptan**	

Other potentially implicated supplements:
5 HTP

- **Based on one case report combining SAMe with other drugs that elevate serotonin could cause serotonin syndrome. These include MAO inhibitors, SSRI's, tricyclics and antimigraine drugs.**
- **Most antidepressant drugs have some serotonergic effects. In addition the nonnarcoticanalgesic tramadol (Ultram) affects serotonin and has been associated with serotonin syndrome.**
- **The supplement 5-HTP is a serotonin precursor and as such could also potentially contribute to serotonin syndrome.**
- **Avoid combining SAMEe or 5 HTP with drugs that elevate serotonin levels.**

CLONIDINE - YOHIMBE *2*
Related drugs:

ACE inhibitors	**Alpha adrenergic blocking agents**	
Antihypertensives	**Beta blockers**	
CNS stimulants	**Calcium channel blockers**	
MAO inhibitors	**Phenothiazines**	**Tricyclics**

- **Yohimbine, primary active ingredient of Yohimbe, may increase blood pressure, offsetting the antihypertensive effects of established antihypertensives (eg. beta blockers and calcium channel**

blockers). Yohimbe may also interact with the other above mentioned drugs. Suggest monitoring blood pressure if Yohimbe is added to an antihypertensive regime.

CO ENZYME Q10 - ACETOHEXAMIDE *3*
Related drugs

Chlorpropamide	**Glipizide**	**Glyburide**
Phenformin	**Tolazamide**	**Tolbutamide**

- **Some oral hypoglycemic drugs appear to inhibit activity of Q10, may worsen an existing deficiency of Q10 in patients with diabetes supplementation may reduce glucose levels. A typical dose of 30-100mg Q10 daily may benefit if taking oral hypoglycemics reducing the glucose levels - monitor during, watch for fatigue, restlessness, malaise, irritability, weakness.**

CO ENZYME Q10 - CHLORPROMAZINE *3*
Related drugs

Phenothiazines: Acetophenazine Fluphenazine Mesoridazine Methotrimeprazine Perphenazine Prochlorperazine Promazine Promethazine Propiomazine Thiethylperazine Thioridazine Trifluoperazine Triflupromazine
Tricyclic andidepressants: Amitriptyline Amoxapine Clomipramine Desipramine Doxepin Imipramine Nortriptyline Protriptyline Trimipramine

- **Phenothiazines and tricyclic antidepressants have been reported to inhibit enzymes containing coenzyme Q1. It has been suggested that CoQ10 might help prevent the myocardial-depressant effects of the phenothiazines and cardiac related adverse effects of tricyclic antidepressants - not been proved. Typical supplemental dose of CQ10 is 30-100 mg daily.**

COENZYME Q10 - LOVASTATIN *2*
Related Drugs:

Atorvastatin	**Cerivastatin**	**Fluvastatin**	**Pravastatin**
Simvastatin			

- **Statin drugs lower coenzyme Q10 levels along with cholesterol. In adequate Co10 levels may adversely affect cardiac function and other fundamental energy processes of the body. CoQ10 is an endogenous antioxidant and an essential component of the electron transfer system in mitochondrial membranes. It is present in cardiac muscle and other tissues and appears to play a fundamental role in producing the mitochondrial cell energy needed for normal heart function.**
- **Statin drugs work by inhibiting HMG-CoA reductase, an enzyme necessary for the synthesis of cholesterol and CoQ10 - so statins tend to lower serum levels of CoQ10 along with cholesterol.**
- **Consider supplementation of CoQ10 if taking statin drugs, esp. if person is compromised cardiac function.**

COENZYME Q10 - PROPRANOLOL *2*

Beta Blockers: Acebutolol Atenolol Betaxolol Bisoprolol Carteolol Esmolol Metoprolol Nadolol Penbutolol Pindolol Propranolol Sotalol Timolol
Other antihypertensive drugs: Bendroflumethiazide Benzthiazide Chlorothiazide Clonidine Hydralazine Hydrochlorothiazide Hydroflumethiazide Indapamide Methyclothiazide Methyldopa Metolazone Polythiazide Quinethazone Trichlormethiazide

- **Vitro studies show various antihypertensive drugs, particularly the beta blocker Propranolol, appear to inhibit enzymes containing CoQ10 in heart muscle tissue - diminished myocardial contractility and cardiac output - causing fatigue esp. in elderly, and could be related to drug induced inhibition of CoQ10 enzymes in the mhocardium. This effect could be especially significant in patients with a preexisting CoQ10 deficiency. Of the beta blockers, Timolol showed negligible inhibition.**
- **The vitamin like substance CoQ10 (Ubiquinone) is present naturally in cardiac muscle and other tissues and appears to play a fundamental role in producing the mitochondrial cell energy needed for normal heart function. Energy deficiency of heart muscle cells is believed to be one**

of the numerous possible causes of myocardial dysfunction and may play a significant role in the progression of heart failure. CoQ10 levels may have been found to be significantly decreased in those with myocardial failure (dilated and restrictive cardiomyopathy and alcoholic heart disease) compared to normal myocardium. The more severe the disease, the lower the tissue levels of CoQ10. In an open study of 40 patients in severe heart failure (classes III and IV), nearly 2/3 showed objective and subjective improvement when treated with 100 mg of CoQ10 daily. CoQ10 deficiencies have also been found in hypertensive patients taking antihypertensive drugs and those not taking them.

- **Based on assays for drug induced inhibition of enzymes containing CoQ10, in mitochondrial preparations from beef heart, various antihypertensive drugs were found to have an inhibiting effect. Of the beta blockers, Propranolol substantially inhibited the CoQ10 enzyme NADH-oxidase, Metoprolol was less inhibitory than Propranolol and Timolol showed negligible inhibition which correlates with Timolol's low cardiac depressant effects. Another in vitro study of antihypertensive drugs found similar results. Propranolol was the greatest inhibitor of NADH-oxidase; Metoprolol which is structurally similar to Propranolol showed 25% as much inhibition. Of 268 hospitalized patients receiving propranolol about 10% had adverse reactions related to depressed myocardial function associated with the drug, and some of the side effects occurred at a dose of 30mg daily or less.**

- **In an open study, 3 of 5 subjects taking Propranolol complained of general malaise, while none of 7 subjects taking a combinatiuon of Propranolol and CoQ10 reported this side effect.**

COLLOIDAL SILVER

- **Can reach with thyrosine, penacillamine, quinolones, tetracyclines.**
- **Not during pregnancy if using these products. Limit intake of colloidal silver if kidney trouble or liver disease.**
- **Though considered a powerful germicide - when taken in excess amounts can be a potential toxin to living tissues. As silver has no known biological function in the human body, it will be excreted within 24 hours. But, only a small quantity - approximately 50 mcg per day - can be excreted. The remaining silver particles are deposited under the skin and tissues as silver sulfide. This probably leads to many health issues.**
- **Argyria is one of the serious side effects caused by the prolonged ingestion of colloidal silver. It is a dermatological condition, characterized by grayish-blue pigmentation of the whole body. No effective treatment is available for argyria. However, no known cases of argyria have been reported from pure and protein-free colloidal silver**

COPPER - ORAL CONTRACEPTIVES *3*

- **Oral contraceptives (OCs) appear to increase serum copper concentrations. Third generation OCs may elevate serum copper levels to a greater extent, possibly because of the newer progestins they contain.**
- **In a study, plasma copper concentrations were significantly higher in women than in men and were higher in women taking OCs. Another found that OC use was associated with elevated serum copper and ferritin values and lowered serum magnesium levels.**
- **Progestins in OCs are believed to be the primary determinant of elevated copper levels. A study of 610 women 18-44 yr old determined that higher serum copper concentrations in women using OCs was more strongly linked to progestin content than to estrogen. Serum copper concentrations differed only marginally in relation to estrogen content. Use of OCs containing lower doses of ethylestradiol was associated with a greater increase in serum copper levels; this could reflect the fact that newer progestins are used in combination with low dose ethylestradiol. There may be increased mortality from cardiovascular diseases with higher serum copper levels (not proved). High serum copper and low serum zinc concentrations are associated with increased mortality from all cardiovascular diseases and from coronary heart disease in particular.**

- **Another epidemiologic study suggested that high copper status, reflected by elevated serum copper concentration may be an independent risk factor for ischemic heart disease.**
- **No clear path of what to do at this time.**

CORTICOSTEROIDS - CHROMIUM *2*

Related drugs:

Betamethasone	**Cortisone acetate**	**Dexamethasone**
Hydrocortisone	**Methylprednisolone**	**Prednisolone**
Prednisone	**Triamcinolone**	

- **Chromium may help control corticosteroid-induced diabetes.**
- **Chromium picolinate (200 3Xday) to those with uncontrolled corticosteroid induced diabetes showed within a week that blood glucose values in 47 of 50 patients decreased from the baseline of greater than 13.9 mmol/L to less than 8.3mmol/L even though oral antidiabetic drug or insulin dose was reduced by half prior to starting chromium. After 2 weeks chromium was reduced to 200 mg daily and in 3 patients the blood glucose level increased, but returned to acceptable levels as soon as chromium was taken at the maintenance dose of 200 mg daily.**
- **Chromium may be used to prevent and control corticosteroid-induced diabetes.**

CYCLOSPORINE - ECHINACEA *2*

Related drugs:

Azathioprine	**Basiliximab**	**Corticosteroids**	**Daclizumab**
Muromonab	**Mycophenolate**	**Tacrolimus**	

Other potentially implicated herbs:

Andrographis	**Ashwagandha**	**Astragalus**	**Garlic**
Ginseng (panax)	**Maitake**	**Reishi**	**Schisandra**
Suma			

- **The immunomodulating effects of echinacea might diminish the effectiveness of cyclosporine and other immunosuppressants. Echinacea might increase interferon-alpha, interferon-beta, tumor necrosis factor-alpha, and IM levels. Echinacea strongly activates macrophages. However in 5 studies, the number of white blood cells was unafected and the phagocytic activity of polymorphonuclear neutrophil granulocytes was enhanced in only 2 of the five studies. These agents are usually given to prevent organ rejection after a transplant and interfering with them could be life threatening so no echinacea immediately before, during or after transplanting.**

CYCLOSPORINE - IPRIFLAVONE *2*

Related drugs:

Corticosteroids	**Methotrexate**	**Other immunosuppressants**

- **Ipriflavone is a semisynthetic photoestrogen used to treat osteoporosis.**
- **Ipriflavone might decrease leukocyte count, potentiating the action of immunosuppressant drugs.**

CYCLOSPORINE - ST. JOHN'S WORT *1*

Related Drugs

CYP3A4 and P-glycoprotein	**Saquinavir**	**Indinavir**

Drug substrates, including cyclosporine, digoxin, warfarin, oral contraceptives, theophylline, simvastatin, lovastatin, and atorvastatin (but not pravastatin)

- **Concommitant use of St. John's wort extract causes increased metabolism, and possibly**
- **impaired absorption of the immunosuppressive drug cyclosporine.**
- **Suggested not to use St. John's Wort before, during or after transplants.**

DIDANOSINE

This drug blocks reproduction of human immunodeficiency virus (HIV) which is the virus causing acquired immunodeficiency syndrome (AIDS). It is used in combination with other drugs to treat HIV.

Riboflavin

- **Persons with AIDS develop lactic acidosis and fatty liver while taking didanosine and other drugs in this class. Didanosine can inhibit crucial DNA related riboflavin activity. Suggest replenishing the lost riboflavin.**

Acetyl L carnitine

- **Severe peripheral neuopathy often develops when taking didanosine or other drugs in this class**
- **It has been found those people were deficienty in acetyl-L-carnitine - taking 1500 mg twice daily resulted in improvement.**

Shiitake (Lentinas edodes)

- **Lentinan is a complex sugar found in shiitake, recognized as an immune modulator.**
- **Didanosine-lentinan combination improved CD4 immune cell counts better than using**
- **Didanosine alone.**

DIGITALIS

- **Don't take Siberian Ginseng with Digitalis - can cause digitalis toxicity. The adaptogen makes you more efficient, making the system more efficient therefore not needing as much digitalis.**
- **Adaptogens might (not sure) change the rate at which the liver clears stuff.**

DIGOXIN - FOXGLOVE *1*

Other Potentially implicated Herbs:

Adonis	**Dogbane**	**False Hellebore**	**Lily of the valley**
Milkweed	**Motherwort**	**Oleander**	**Pheasant's eye**
Strophanthus	**Uzara root**	**Whie quill**	**Wild Ipecac**

Other:

Magnesium	**Potassium**	**Alder buckthorn, buckthorn**
Cascara	**Eleuthero**	**Hawthorn**
Licorice	**Digitalis**	**Licorice**
Pleurisy root	**Sarsaparilla**	**Senna**
St. John's wort	**Food**	

Digoxin is a drug originally derived from the foxglove plant, Ditigalis lanata. Digoxin is used primarily to improve the pumping ability of the heart in congestive heart failure. It also helps normalize some dysrhythmias.

Magnesium: People needing digoxin may have low levels of potassium or magnesium, increasing the risk of digoxin toxicity. Digoxin therapy may increase magnesium elimination from the body therefore will benefit with supplementation.

Potassium: Potassium transport from the blood into cells is impaired by digoxin. Although digoxin therapy does not usually lead to excess potassium in the blood (hyperkalemia), an overdoes of digoxin could cause a potentially fatal hyperkalemia. People taking digoxin should therefore avoid takin potassium supplement or eating large quantities of fruit (bananas, apples). On the other hand, many people taking digoxin are also taking a diuretic and they may therefore need more potassium.

Alder buckthorn, buckthorn (Rhamnus catartica, Rhamnus frangula, Frangula alnus): Use of these for more than ten consecutive days may cause a loss of electrolytes and potassium. Loss of potassium may increase the toxicity of digitalis like medications with potentially fatal consequences.

Cascara (Rhamnus purshiani cortex)

Loss of potassium due to cascara abuse could theoretically increase the effects of digoxin and other similar heart medications with potentially fatal consequences. However no cases have been reported.

Digitalis (digitalis purpurea)

Foxglove contains chemicals with actions and toxicities similar to digoxin. It is used as an

herbal medicine to treat heart conditions before the drug digoxin was available. Do not use together, Digoxin type effects may be exacerbated if digoxin is used with foxglove (digitalis). These herbs contain cardiac glycosides that could cause similar problems. Glycoside poisoning manifests as blurred vision, strong but slowed pulse, nausea, vomiting, dizziness, frequent urination, contracted pupils. In severe cases: fatigue, confusion, stupor, cardiac disturbances including arrhythmias.

Eleuthero (Eleutherococcus senicosus)

People taking digoxin require regular monitoring of serum digoxin levels. One report where the person used Siberian ginseng to stable therapeutic digoxin treatment was associated with dangerously high serum digoxin levels and the person never experienced symptoms of digoxin toxicity. Lab analysis found the product was free of digoxin like compounds but the contents were not further idenitified. This report may reflect an interaction of eleuthero with the lab test to cause a falsely elevated reading, rather than actually increasing digoxin levels.

Hawthorn (Crataegus oxyacantha, or monogyna)

Hawthorn leaf with flower extract is approved in Germany to treat mild congestive heart failure. Consult doctor before adding this to a dose of digoxin. No reports that hawthorn enhances the effects of digoxin.

Licorice (Glycyrrhiza glabra)

Potassium deficiency increases the risk of digoxin toxicity. Excessive use of licorice plant or licorice plant products may cause the body to lose potassium (not the artificial flavoring). If taking digoxin, read product labels carefully for licorice plant ingredients.

Pleurisy Root

As pleurisy root and other plants in the Asclepius genus contain cardiac glycosides, best to avoid its use when using digoxin.

Sarsaparilla (Smilax spp)

Sarsaparilla may increase absorption of digitalis and bismuth, increasing chance of toxicity.

Senna (Cassia senna, Cassia angustifolia)

Bisacodyl is a laxative similar in action to senna, given with digoxin decreased serum digoxin levels. In those taking digoxin with laxatives, there was a decrease in digoxin levels. Thre was also concern that overuse or misuse of senna may deplete potassium levels and increase digoxin activity and toxicity.

St. John's wort (Hypericum perforatum)

One trial suggested St. John's wort may reduce blood levels of digoxin. 5 volunteers added 900 mg St. John's wort while continuing to take digoxin. Normal blood level reached after 5 days, but dropped when St. John's wort was added. May have occurred because certain chemicals found in St. John's wort activated liver enzymes that are involved in the elimination of some drugs.

Food

Many food interefere with absorption of digestion. Take digoxin 1 hour or 2 hr after eating food.

DIGOXIN - GINSENG *1*

Siberian ginseng (Eleuthrococcus senticosus) has been shown to falsely elevate measured serum digoxin levels without concomitant digoxin toxicity. Therefore this is not actually an interaction with the drug, but with the test for the drug. Digoxin has a narrow therapeutic window requiring close monitoring with blood assays. Eleutherococcus might interfere with this assay and hence presents a pracical problem if taken concomitantly with digoxin.

DIGOXIN - KYUSHIN *2*

Kyushin may interfere with digoxin, creating fasely elevated readings. Kyushin is the dried venom of the Chinese toad Bufo bufo argarizans Canntor which purportedly has digoxin like actions.

DIGOXIN - LICORICE *2*
Other potentially implicated Herbs:
If overused as a laxative: Senna Cascara sagrada Drug aloe
Licorice may cause a significant decrease in serum potassium, predisposing patients to symptoms of digoxin toxicity.
One often unrecognized source of licorice is chewing tobacco which can result in a low serum potassium level.

DIGOXIN - MAGNESIUM *3*
Related Drugs:
Deslanoside Digitoxin Digitalis
Magnesium might impair digoxin absorption, however magnesium deficiency can increase the risk of digoxin toxicity. Magnesium supplementation may be advisable during digoxin treatment because hypomagnesemia in individuals on digoxin is relatively common and might predispose hemto digitalis induced cardiac arrhythmias. However taking it at the same time might inhibit the absorption of Digoxin. Later studies show this to be only mildly true however to be on the safe side - take 2 hr apart.

DIGOXIN - ST. JOHN's WORT *1*
Related Drugs:
Cyclosporine Indinavir Oral Contraceptives (possibly)
St. John's wort may reduce serum levels of digoxin by interfering with its intestinal absorption. Measure serum levels carefully if they are taken at the same time. If the person has been taking both and stops the herb, rebound toxicity may occur.

DILTIAZEM
This is a calcium channel blocker used for angina pectoris, heart arrhythmias, high blood pressure.

DHEA
Dehydroepiandrosterone. Diltiazem raised blood levels of DHEA and CHEA sulfate in insultin resistant, obese men with high blood pressure.

Pleurisy root
Because of cardiac glycosides in Pleurisy root (Aesclepius), best to avoid with heart meds such as calcium channel blockers.

Food
Diltiazem can be taken with or without food. Sustained release diltiazem should be swallowed whole without opening, crushing or chewing. Avoid taking grapefruit juice at the same time which results in higher blood levels. Some studies suggest that grapefruit juice may affect drug availability even if it is consumed at different time.

DIMENHYDRINATE
This is a combination of diphenhydramine and chlorotheophylline, used to prevent and treat nausea, vomiting, dizziness, motion sickness.

Henbane (Hyoscyamus niger)
Antihistamines, including dimenhydrinate, can cause 'anticholinergic' side effects like dryness of mouth and heart palpitations. Henbane also has anticholineric activity and side effects, avoid using at same time.

Alcohol
The drug causes drowsiness and alcohol may intensify this effects, may cause accidental injury.

DIPHENHYDRAMINE
This is an antihistamine, used for allergies and symptoms incl. skin reactions, short term sleep

aid, coughs due to colds or allergy, prevention of motion sickness. It is a nonprescription.

Henbane

Antihistamines can cause anticholinergic side efects like dryness of mouth, heart palpitations. Henbane also has anticholinergic activity and side effects, therefore avoid using at same time.

Alcohol

As diphenhydramine causes drowsiness, avoid using alcohol which can also cause same, leading to accidental injuries.

DIPYRIDAMOLE

Prevents platelet clumping, used often with warfarin to prevent clotting. Can be used alone or with aspirin.

Iron

Taking too much iron if not iron deficient can result in tissue damage that may contribute to heart disease. Dipyridamole blocks platelet clumping caused by iron which might reduce the damage caused by iron.

Garlic

Ajoene, a garlic compound, prevents platelet clumping and enhances the beneficial action of dipyridamole. Further research needed.

Coffee/caffeine

Taking dipyridamole can cause reduction in amount of oxygen delivered to the heart, resulting in rare side effect of angina pectoria. It is therefore sometimes used for heart stress tests. One person who consumed coffee prior to the test failed to experience the expected reduction in blood flow. Need further testing.

DIURETICS

Acetazolamide Carbonic Anhydrase Inhibitors Diamox
Mannitol Methazolamide neptazane

Diuretics are used to reduce water accumulation or edema associated with heart failure, cirrhosis, therapy, and treat high blood pressure. If they cause loss of potassium in in urine they are called 'potassium-depleting'; if they cause retention of potassium they are called 'potassium sparing'.

<u>Potassium depleting Carbonic anhydrase inhibitors:</u>
Acetazolamide (Diamox)
Dichlorphenamide (Daranide) Methazolamide (Neptazane)

<u>Potassium depleting Thiazide Diuretics:</u>
Bendroflumethiazide (Naturetin)
Benzthiazide (Exna)
Chlorothiazide (Diuril)
Hydrochlorothiazide (Esidrix,
HydroDiuril,
Microzide,
Avalide)
Hydroflumethiazide (Diucardin)
Indapamide (Lozol)
Methyclothiazide (Enduron)
Metolazone (Zaroxolyn, Mykrox)
Polythiazide (Renese)
Quinethazone (Hydromax)
Trichlormethiazide (Naqua)

Potassium depleting Loop Diuretics:
Bumetanide (Bumex)
Ethacrynic acid (Edecrin)
Furosemide (Lasix)
Torsemide (Demadex)

Potassium sparing:
Amiloride (Midamor)
Amiloride and Hydrochlorothiazide (Moduretic)
Spironolactone (Aldactone)
Spironolactone & Hydrochlorothiazide (Aldactazide)
Triamterene (Dyrenium)
Triamterene & Hydrochlorothiazide (Dyazide, Maxzide)

Note: Taking diuretics for long term (6mo) usually lowers folic acid and elevates homocysteine. Homocysteine is a toxic amino acid by-products, associated with atherosclerosis. Use of buckthorn or alder buckthorn for more than 10 days may cause loss of electrolytes, esp. mineral potassium.

Note: Licorice causes the body to retain fluid, should not be used with Potasium sparing drugs such as Triamterene.

ESTROGEN - BORON *3*
Related Drugs:

Conjugated estrogens	**Esterifie estrogens**	**Estradiol**
Estropipate	**Ethinyl estradiol**	

Boron may increase serum levels of endogenous estrogen and minimize the loss of mienrals needed for bone mineralization - but this may increase the risk of estrogen side effects. If using ERT or HRT, use boron with caution - perhaps instead take a diet of high amounts of fruits and vegetables.

ESTROGEN - DONG QUAI *4*
Related Drugs:

Conjugated estrogens	**Esterified estrogens**	**Estradiol**
Estropipate	**Ethinyl estradiol**	

Dong quai contains beta sitosterol, a phytoestrogen.
However it is unlikely that dong quai will interact with estrogen or estrogen-related entities.

ESTROGEN - GINENG (Panax) *3*
Related Drugs:

Conjugated estrogens	**Esterified estrogens**	**Estradiol**
Estropipate	**Ethinyl estradiol**	

Ginseng can occasionally cause symptoms of estrogen excess, such as mastalgia, vaginal breakthrough bleeding, nausea and bloating. No evidence indicating that ginseng ordinarily produces an estrogenic effect but several case reports have linked ginseng to symptoms of estrogen excess.

ESTROGEN - IPRIFLAVONE *2*
Related Drugs:

Conjugated estrogens	**Esterified estrogens**	**Estradiol**
Estropipate	**Ethinyl estradiol**	

Ipriflavone, a synthetic isoflavone that inhibits bone resorption, may enhance the bone

preserving effects of estrogen as well as provide a benefit when used alone. Combination treatment with estrogen and ipriflavone raises at least some concern that ipriflavone might increase the risk of hormone-dependent uterine and breast malignancies.
Adding ipriflavone to conventional estrogen therapy for esteoporosis prevention or treatment may produce an additive benefit and also allow lower doses of estrogen to be used, although attention should be paid to the possibility that ipriflavone might increase the risk of hormone dependent uterine and breast malignancies.

ESTROGEN - RESVERATROL *3*
Related Drugs

Conjugated estrogens	**Estrified estrogens**	**Estradiol**
Estropipate	**Ethinyl estradiol**	

Resveratrol marketed as chemopreventive agent is closely related chemically to diethylstilbestrol. This has raised concerns of possibly interactions between resveratrol and estrogen therapy.
Avoid taking the two supplements together.

ETOPOSIDE - ST. JOHN'S WORT *2*
Related Drugs:

Doxorubicin	**Mitoxantrone**	**Teniposide**

St. John's Wort may interfere with the desired anticancer action of etoposide.

It would be prudent for cancer patients to avoid St. John's wort while on any chemotherapeutic regime containing a topoisomerase II poisoning drug such as etoposide until more studies are done.

FEXOFENADINE - FRUIT JUICE *3*
Grapefruit, orange, and apple juice may reduce the efficacy of fexofenadine (Allegra).

FLUOROQUINOLONES - MINERALS *2*
Related Drugs:

Ciprofloxacin	**Enoxacin**	**Grepafloxacin**
Lomefloxacin	**Norfloxacin**	**Ofloxacin**
Sparfloxacin	**Trovafloxacin**	

Other potentially implicated supplements:

Aluminum	**Calcium**	**Iron**
Magnesium	**Zinc**	

These minerals may interfere with the absorption of fluoroquinolone antibiotics. antacids containing aluminum and magnesium may interact similarly with these antibiotics.
Calcium containing dairy products or calcium containing antiacids may decrease the absorption of some fluoroquinolones. Milk (200 ml) reduces absorption of norfloxacin and ciprofloxacin in 6 fasted volunteers.

Give mineral supplements and milk as far apart as possible from fluoroquinolone antibiotics.
Administer antacid at least 6 hours before or 2 hours after fluoroquinolone antibiotics.

FOLATE - ALUMINUM HYDROXIDE *3*
Antacids containing aluminum hydroxide may bind to folate and reduce its absorption..
Adequate folate nutrition is needed to prevent heart disease and neural tube defect.
Antacid induced reduction in folate absorption appears to be small. However because folate deficiency is common, individuals who regularly take aluminum hydroxide antacids should take folate (folic acid).

FOLATE - CARBAMAZEPINE *2*
Related Drugs:

Barbiturates Phenobarbital Primidone Valproic acid

The anticonvulsants carbamazepine, phenobarbital, and primidone may lower serum folate levels by both increasing its hepatic metabolism and decreasing its absorption. Primidone, which is metabolized to phenobarbital, may also inhibit the growth of folate-dependent micro organisms. Valproic acid appears not to induce enzymes but may decrease folate absorption.
Folate supplement may prevent anticonvulsant induced folate depletion. Suggest 400 mg and 6 mg B12 to prevent deficiency.

FOLATE - CIMETIDINE *3*
Related Drugs

Famotidine Lansoprazole Nizatidine Omeprazole
Rabeprazole sodium Ranitidine

By reducing stomach acid, H2 antagonists and proton pump inhibitors may marginally reduce the body's absorption of folate.
The extent of drug induced folate absorption appears to be relatively small, but patients receiving long term therapy with an H2, antagonist or a proton pump inhibitor may benefit from folate supplementations.

FOLATE - METHOTREXATE *1*
Related Drugs:

Pyrimethamine Trimetrexate

Treatment with methotrexate can impair folate status and this may caue some of the symptoms of methotrexate toxicity. In certain disease states, folate supplementation has been found to decrease methotrexate toxicity without interfering with its therapeutic effects.

FOLATE - NSAIDs *1*
Related Drugs:

Aspirin	**Bromfenac**	**Diclofenac**	**Etodalac**
Fenoprofen	**Flurbiprofen**	**Ibuprofen**	**Indomethacin**
Ketoprofen	**Ketorolac**	**Meclofenamate**	**Mefenamic acid**
Meloxicam	**Nabumetone**	**Naproxen**	**Oxaprozin**
Piroxicam	**Sulfasalazine**	**Sulindac**	**Tolmetin**

Nonsteroidal anti-inflammatory drugs (NSAIDs) may interfere with folate metabolism. Folate is needed for heart disease, neural tube defect etc. Sulfasalazine appears to competitively inhibit intestinal folate transport and absorption (according to a tissue culture study). May need to increase folic acid when taking NSAIDs.

FOLATE - ORAL CONTRACEPTIVES *4*
Oral contraceptives have been reported to lower serum and/or red blood cell folate in most, but not all studies. Doesn't appear to cause a folate deficiency under ordinary circumstances.

FOLATE - PHENYTOIN *2*
Related Drugs:

Ethotoin Mephenytoin

Phenytoin decreases serum folate levels, and folate decreases serum phenytoin levels.
Folate deficiency occurs in some patients with epilepsy taking anti-convulsant drugs and there is a high incidence of nero-psychiatric illness in cases of megaloblastic anemia caused by folate deficiency.

FOLATE - TRIAMTERENE *4*
High dose triamterene might cause folate deficiency. Triamterene in high doses might be given for cirrhosis, therefore extra folate should be considered.

FOLATE - TRIMETHOPRIM/SULFAMETHOXAZOLE *1*
Related Drugs:

Dapsone (DDS)	Sulfones	Sulfonamides

Trimethoprim and sulfamethoxazole may impair folate metabolism. There are also concerns that supplementing with the folate might antagonize the effects of the drug.

FUROSEMIDE - GINSENG/GERMANIUM *1*
Related Drugs:

Bumetanide	Torsemide	Ethacrynic acid

Ginseng doesn't appear to interact, but geranium supplemented ginseng can cause diuretic resistance. Avoid concomitant use.

FUROSEMIDE - GOSSYPOL *2*
Related Drugs:

Bumetanide	Ethacrynic acid	Hydrochlorothiazide
Torsemide	Triamterene	

Taking grossypol with diuretics which promote potassium loss may result in hypokalemia. Triamterene has been found ineffective in preventing this loss. Check potassium levels every 6 weeks for first 3 months, then every 3 months thereafter for the first year.

GLYBURIDE - CHROMIUM *2*
Related Drugs:

Acarbose	Acetohexamide	Chlorpropamide
Glimepiride	Glipizide	Insulin
Metaformin	Miglitol	Pioglitazone
Repaglinide	Rosiglitazone	Tolazamide
Tolbutamide	Troglitazone	

Chromium may reduce oral hypoglycemic or possibly insulin requirements in those with diabetes. Reduction in medicine may be needed.

GLYBURIDE - GINSENG (Panax) *2*
Related drugs:

Acetohexamide	Chlorpropamide	Glipizide
Insulin	Metformin	Tolazamide
Tolbutamide	Troglitazone	

Other potentially implicated herbs:

Bilbery	Garlic	Bitter melon
Gymnema sylvestre	Coccinia indica	

Concomitant use may predispose the person to hypoglycemic responses because ginseng appears to decrease blood glucose levels. Other herbs may possess similar effect. If you use ginseng and have diabetes mellitus, monitor blood glucose closely. Be on the look out for hypoglycemic indications.

GLYBURIDE - VITAMIN E *3*
Related drugs:

Acetohexamide	Chlorpropamide	Glipizide
Insulin	Tolazamide	Tolbutamide

High dose Vit. E might improve glucose transfport, thus improving insulin sensitivity. This may mandate a reduction in hypoglycemic drug dosages during concurrent use.

GREEN TEA EXTRACT

Lithium	Closapine

HALOPERIDOL - KAVA *2*
Related Drugs:

Carbidopa	Chlorpromazine	Eldepryl	Fluphenazine
Levodopa	Loxapine	Mesoridazine	Metoclopramide
Molindone	Perphenazine	Pimozide	Prochlorperazine
Promazine	Thioridazine	Thiothixene	Trifluoperazine
Triflupromazine			

Kava may possess dopamine anatagonism effects and increase the risk of neuroleptic-induced movement disorders, may counter the effect of medications for Parkinson's. Four cases have been reported. Suggest not using at same time.

HALOPERIDOL - PHENYLALANINE *3*
Related Drugs:

Acetophenazine	Chlorpromazine	Clozapine	Fluphenazine
Haloperidol	Loxapine	Mesoridazine	
Methotrimeaprazine	Molindone	Olazpine	
Perphenazine	Pimozide	Prochlorperazine	Promazine
Promethazine	Propiomazine	Quetiapien	Risperidone
Thiethylperazine	Thioridazine	Thiothixene	
Trifluoperazine	Triflupromazine		

Suggest phenylalanine might worsen symptoms of drug induced tardive dyskinesia. Tardive Dyskinesia is a neurologic disease associated with the use of antipsychotics and other psychotherapeutice agents characterized by the involuntary movements in the perioral region (tongue, mouth, jaw, eyelids, face). Advise not to take phenylalanine if on any of these drugs.

HEPARIN - PHOSHATIDYLSERINE *3*
Related Drugs:

Anisindione	Warfarin	Dicumarol

The combination of phosphatidylserine and phosphatidlethanolamine enhanced heparin's effect on coagulation time. Interaction is only hypothetical at this time.

HEPARIN - VIT. C *4*
Weak evidence suggests high concentrations of Vit. C reduced anticoagulant effect of heparin.

HERBS TO USE WITH CAUTION
Beta carotene
Blue-green Algae
Chaparral - liver toxicity
Coltsfoot
Comfrey - liver toxicity
Germander
Germanium
Green Tea Extracts
Greater Celandine
Kava
Kombucha
Mistletoe
Pennyroyal
Pokeroot
Sassafras
Skullcap
Spirulina
Vit. A Vit. B3

IBUPROFEN - FEVERFEW *2*

Related Drugs:

Diclofenac	Etodolac	Fenoprofen	Flurbiprofen
Indomethacin	Ketoprofen	Ketorolac	Meclofenamate
Nabumetone	Naproxen	Oxaprozin	Pirxicam
Sulindac	Tolmetin		

Other potentially Implicated Herbs:

White willow

Feverfew appears to suppress prostaglandin production and might therefore increase NSAID side effects. White willow is similar because it contains salicylates. Best not to combine.

INDINAVIR - ST. JOHN'S WORT *1*

Related Drugs

Clclosporine HIV protease inhibitors

CYP3A4 and P-glycoprotein drug substrates, including cyclosporine, digoxin, oral contraceptives, warfarin, theophylline, simvastatin, lovastatin, atorvastatin (but not pravastatin)

Using St. John's wort extract concommitantly increases increased metabolism of the HIV protease inhibitor Indinavir to a sufficient extent that anti-retroviral resistance and outright treatment failure are real possibilities.

INSULIN

Insulin is a natural protein made by the pancreas that helps the body use sugar. Insulin is injected by all people with type 1 (insulin dependent) diabetes mellitus and by some people with type (non-insulin dependent) diabetes mellitus to help control blood sugar levels.

Any substance (dietary, supplemental, herbal, and others) that affects blood sugar levels will directly or indirectly affect the amount of insulin required by a person with diabetes. Eg. consuming a high fiber diet and/or supplementing with nutrients like chromium, biotin, Vit. E or herbs like Gymnema sylvestre will often improve blood sugar control in diabetics. In such cases the amount of insulin may need to be reduced in order to avoid a hypoglycemic reaction.

Anyone taking insulin should consult the prescribing physician before making dietary changes or taking nutrients or herbs that are designed to lower blood sugar levels.
Insulin has been shown to decrease levels of DHEA and DHEA sulfate in the blood. Fenugreek of 100g daily for 10 days showed reduction in blood sugar, urinary sugar excretion, serum cholesterol, triglycerides with no change in insulin levels. 25g a day for 24 weeks showed significant reduction in blood glucose levels.

Alcohol may increase action of insulin, leading to hyperglycemia (low blood sugar).

Smoking may decrease insulin activity.
Monitorlevels if taking Biotin, Chromium, Fenugreek, Cinnamon, Gymnema, Vit. E, Tobacco.

INSULIN - VANADIUM *3*

Related Drugs

Acetohexamide	Chlorpropamide	Glimepiride	Glipizide	Glyburide
Metformin	Pioglitazone	Repaglinide	Rosiglitazone	Tolazamide
Tolbutamide	Troglitazone			

Vanadium may reduce insulin requirements in patients with diabetes. May reduce insul requirements by 14% in Type 1. Type 2, the vanadium increased insulin sensitivity resulting in less glycogenolysis and improved glycogen storage. Monitor blood sugar carefully if using.

IPECAC - POTASSIUM
Ipecac syrup is used to induce vomiting in treatment of drug overdoses and some poisonings. It is also used by some to void gaining weight. The side effect of abusing the use of this drug is reduction of potassium due to the frequent vomiting.

IRON - CALCIUM CARBONATE *3*
Related drugs:

Calcium acetate	Calcium carbonate	Calcium citrate
Calcium glubionate	Calcium gluconate	Calcium lactate
Calcium phosphate	Tricalcium phosphate	

Related Supplements:

Ferrous fumerate	Ferrous gluconate	Ferrous sulfate
Iron polysaccharide		

Calcium containing antacids and other calcium supplements may reduce iron absorption. Take calcium and antacids apart from meals.

IRON - H2 ANTAGONISTS *3*
Related Drugs:

Cimetidine	Famotidine	Lansopraziole	Nizatidine
Omeprazole	Rabeprazole sodium	Ranitidine	

Other Potentially Implicated Supplements:

Ferrous fumerate	Ferrous gluconate	Ferrous sulfate
Iron poilysaccharide	Minerals, Zinc	

By increasing gastric pH levels, H2 antagonists and other drugs that inhibit gastric acid secretion might interfere with absorption of iron and zinc, possibly other minerals that are best absorbed under acidic conditions.

IRON SALTS - BEVERAGE TEAS *3*
Other potentially implicated herbs:

Agrimony	Apricot	Artichoke	Avens	Bilberry
Birch leaf	Blackberry leaf	Black tea	Blue flag	Boldo
Blackthorn berry	Borage	Burnet	Calamus	Cascara
Cassia	Chamomile	Clivers	Cohosh	Cola
Coltsfoot lf	Comfrey	Cornsilk	Cowslip	Damiana
Drosera	Elder	Eucalyptus leaf	Eyebright	Feverfew
Frangula	Gentian	Ground ivy	Hawthorn	Hempnettle
Holythistle	Hops	Horehound	Horse chestnut	
Ispaghula	Jambolan bk	Juniper berry	Knotweed	Lady'smantle
Lady's slipper	Lavender flower	Lemon balm	Linden flwr	Marshmallow
Meadowsweet	Mistletoe	Motherwort	Nettle	Oakbark
Peppermint lf	Pilewort	Plantain	Poplar	Potentilla
Prickly ash	Queens Delight	Raspberry	Rhatany rt	Rhubarb
Rose flwer	Sage leaf	Sassafras	Saw Palm.	Skullcap
Slippery elm	Squill	Stone rt	Tansy	Thyme
Uva ursi	Valerian	Vervain	Walnut lf	Willow
White dead nettle	Witch hazel	Woody nightshade stem		Wormwood
Yarrow	Yellowdock			

If ea is ingested concomitantly with iron supplemtns, concern that iron absorption may be diminished. Tannins/tannic acid are water soluble polyphenols found in many types of beverage teas. Evidence suggests they may decrease absorption of various nutrients, esp. iron.

ISOTRETINOIN - VITAMIN A *2*
Isotretinoin (an isomer of all trans retinoic acid which is a metabolite of retinol) may have additive toxic effects if combined with retinol (Vitamin A) - avoid the combination.

LEVODOPA/CARBIDOPY- BCAAs *2*

Other potentially implicated Supplements:

Amino acid supplements

BCAAs and other amino acid supplements have effects similar to meals high in protein. High protein meals can interfere strikingly with levodopa therapy and aggravate the symptoms of Parkinson's. After dietary protein is broken down into amino acids in the gastro tract, the absorption process is facilitated by amino acid transport. Because levodopa is a derivative of the amino acid phenylalanine, competition between the drug levodopa and dietary amino acids may occur. There may also be competition for the carrier that transports amino acids into the brain.

LEVODOPA/CARBIDOPA - IRON *1*

Related Supplements:

Ferrous fumarate	**Ferrous gluconate**	**Ferrous sulfate**
Iron polysaccharide		

Iron decreases effect of levodopa in Parkinson's by interfering with the absorption of both levodopa and carbidopa. If need to take iron, take it as far apart from levodopa as possible, may also need to increase levodopa.

If you are taking levodopa, avoid bananas, beef, fish, liver, oatmeal, peanuts, potatoes, whole grains which contain a lot of vitamin B6 and interfere with the potency of the drug, and also avoid supplements containing Vit. B6. There are also some amino acids contained in food proteins that can prevent the drug from reaching the brain so do not eat protein in the evening or at the same time you are taking the drug.

LITHIUM - HERBAL DIURETICS *2*

Other Potentially Implicated Herbs:

Broom	**Buchu**	**Burdock**	**Cornsilk**	**Celery seed**	**Cleavers**
Couchgrass	**Dandelion**	**Elder broom**	**Goldenrod**	**Gravelroot**	**Horsetail**
Juniper	**Nettle**	**Parsley**	**Uva ursi**	**Wild carrot**	**Green Tea**

These herbs have diuretic properties. If on Lithium and use diuretic herbs you may experience dehydration which can result from lithium toxicity.

MAGNESIUM - FUROSEMIDE *3*

Related drugs:

Bendroflumethiazide	**Benzthiazide**	**Bumetanide**
Chlorothiazide	**Chlorthalidone**	**Ethacrynic acid**
Hydrochlorothiazide	**Hydroflumethiazide**	**Inapamide**
Methyclothiazide	**Metolazone**	**Polythiazide**
Quinethazone	**Torsemide**	**Trichlormethiazide**

Like thiazide diuretics, loop diuretics such as furosemide increase the urinary excretion of magnesium along with sodium and potassium. In some cases, they may lead to a magnesium deficiency. May need to take extra magnesium.

MAGNESIUM - ORAL CONTRACEPTIVES *3*

Related Drugs:

Ethinyl estradiol	**Estradiol**	**Estrogen**	**Estropipate**

Estrogen enhances magnesium utilization by moving the mineral from the blood into body tissues and bone. Oral contraceptives or estrogen replacement therapy may deplete body stores of magnesium by increasing its uptake and utilization by soft tissues and bone. Consider magnesium supplementation if taking Estrogen or Oral Contraceptives.

MAGNESIUM - POTASSIUM - SPARING DIURETICS *3*

Related drugs:

Amiloride	**Spironolactone**	**Triamterene**

Potassium sparing diuretics may reduce urinary magnesium excretion. According to animal studies, potassium sparing diuretics may reduce urinary excretion of magnesium as well as

potassium. This may be useful if for instance thiazide diuretics and loop diuretics increase the urinary excretion of magnesium along with sodium and potassium - adding a potassium sparing diuretic may help counter this magnesium loss. However, combined magnesium supplementation and treatment with potassium sparing diuretics could conceivably create a risk of hypermagnesemia. If taking potassium sparing diuretics, use magnesium supplements with caution.

MANGANESE - CALCIUM CARBONATE *3*
There is conflict with the studies, but in some cases calcium containing antacids may reduce absorption of manganese. Administer calcium containing antacids 2-3 hours apart from manganese supplements and from meals.

MAO INHIBITORS (momoamine oxidase inhibitors)

- **Because it contains a stimulant ephedrine, combining the herb ephedra with MAO Inhibitors can rapidly produce a severe, dangerous interaction.**
- **MAO-Inhibitors work by blocking an enzyme called monoamine oxidase. Some of the messenger molecules (neurotransmitters) of the brain such as serotonin and norepinephrine, are nomoamines, and if you turn off this enzyme, the result is mroe of these molecules accumulate - result is essentially the same effect as using an SSRI. More neurotransmitters build up between neurons and as a result, the neurons increase in activity. Two most common MAO-Inhibitors are Parnate and Nardil.**
- **MAO inhibitors work more rapidly than the tricyclics. The problem with MAO Inhibitors is due to the inadvertent effect on another chemical called tyramine. Monoamine oxidase enzyme usually breaks down tyramine. If MAO inhibitor is used, tyramine is not broken down as it usually is and levels of this chemical build up. Tyramine causes elevation of blood pressure, so an increase in this chemical leads to an icnrease in blood pressure which could lead to stroke, heart attack and other nasty side effects.**
- **Foods to avoid (those high in tyramine): alcohol, legumes (eg. fava and soy beans), cheese, fish, ginseng, meat, sauerkraut, shrimp paste, soups, yeast extracts (baking yeast o.k. in small quantities).**

- **Avoid with: Ephedra(contains stimulant ephedrine), Scotch Broom(contains high levels of tyramine), Green Tea(contains caffeine), Ginseng(increased side effects), Kava (increased side effects), Licorice (increased side effects), Panax (increased side efffects), St. John's Wort, SAMe,**

METHOTREXATE

- **Green tea behaves similar to the anti-cancer drug Methotrexate.**
- **Treatment with methotrexate can impair folate(folic acid) status and this may caue some of the symptoms of methotrexate toxicity. In certain disease states, folate supplementation has been found to decrease methotrexate toxicity without interfering with its therapeutic effects.**
- **Methotrexate may interfere with Vit. D absorption.**
- **Avoid: Crampbark, Willow, Wintergreen: all increased plasma levels, toxicity, decreased excretion**

METHYLDOPA - IRON *1*
Related Supplements:

Ferrous fumarte	**Ferrous gluconate**	**Ferrous sulfate**
Iron polysaccharid		

Ferrous sulfate and ferrous gluconate can decrease the absorption of methyldopa and interfere with blood pressure control even when taken 2 hours before the drug. Separate the administration times by as long as possible.

NEFAZODONE - ST. JOHN'S WORT *2*
Related Drugs:

Selective serotonin reuptake inhibitor	**Tramadol (SSRI) antidepressants**	**Trazodone**

Other Potentially Implicated Herbs:

Ayahuasca

Concomitant use of St. John's wort extract may cause peripheral serotonin overload, esp. in elderly. The herb ayahuasca which possesses alkaloids with MAO inhibitor action, may give similar risk.

Concomitant use of more than one SSRI should be avoided in all patients with the exception of those refractory to one agent who are being switched to another. In this regard, St. John's wort should be considered equivalent to SSRI pharmaceuticals. If combined, the person should be closely monitored for central nervous system depression, headache, sweating, and/or agitation. Keep in mind the long half-life of some SSRIs esp. fluoxetine. The half-life of hyperforin (active ingredient in St. John's wort), is thought to be about 9 hours.

NIACIN - ISONIAZID *3*

Other potentially implicated supplements:

Niacinamide Nicotinamide Vit. B3

As a Vit. B6 antagonist, isoniazid can interfere with the biosynthesis of niacin which requires Vit. B6. In some cases, this may lead to the development of the niacin deficiency disease pellagra. Consider administering niacin if using the drug, especially if person is poorly nourished. 200 mg daily was used in one study.

NIFEDIPINE - PEPPERMINT OIL *2*

Related drugs:

Amlodipine	**Bepridil**	**Diltiazem**	**Felodipine**
Isradipine	**Nicardipine**	**Nimodipine**	**Nisoldipine**
Nitrendipine	**Verapamil**		

Peppermint oil may alter the effectiveness of nifedipine. Little information but it is conceivable that nifedipine's effectiveness may be diminished.

NITROFURANTOIN -MAGNESIUM *3*

Magnesium may interfere with absorption of nitrofurantoin. Separate administration as long as possible.

NITROGLYCERIN - N-ACETYL CYSTEINE *3*

Related drugs:

Isosorbide dinitrate Isosorbide mononitrate

N-acetyl cysteine *NAC) has been tried as a treatment to reverse the tolerance that develops to the vascular and anti-anginal effects of nitrates. However this combination appears to increase incidence of nitrate side effects including severe headache.

The use of N-acetyl cysteine may in some cases prevent the development of nitrate tolerance however chronic use of NAC in patients taking nitrates may cause side effects that limit its clinical use.

NSAIDs - GOSSYPOL *2*

Related Drugs:

Aspirin	**Diclofenac**	**Etodolac**	**Fenoprofen**
Flurbiprofen	**Indomethacin**	**Ketoprofen**	**Ketorolac**
Meclofenamate	**Nabumetone**	**Naproxen**	**Oxaprozin**
Piroxicam	**Sulindac**	**Tolmetin**	

Concomitant use of gossypol with nonsteroidal anti-inflammatory drugs (NSAIDs)such as ibuprofen may result in troublesome gastrointestinal distress and possible tissue damage. It is common for herbs and drugs to cause gastrointestinal side effects however the propensity of gossypol and NSAIDs to do so appears to exceed others. Avoid concomitant use.

NUTRIENTS - BILE ACID SEQUESTRANTS Nutrients *3* Folate *2*

Related drugs:

Cholestyramine Colestipol

Potentially Implicated Nutrients:

Calcium Iron Folate Vit. A

Bile acid sequestrants have been reported to impair the absorption of numerous nutrients including folate; Vit. A, B12, E, K, iron, calcium. However the effect may not be clinically significant and only folate supplementation may be needed for those on long term therapy with bile acid sequestrants. A folic acid supplement of 5 mg daily appears to be adequate to prevent depletion. Comprehensive multivitamin-mineral supplement might be good insurance.

OMEPRAXOLE - ST. JOHN'S WORT *2*

Related drug:

Lansoprazole

The hypericin of St. John's Wort has been identified as a causative agent in the development of photosensitivity. Combination with proton pump inhibitors may increase this effect. Advise patients to avoid prolonged sun exposure if taking both.

ORAL CONTRACEPTIVES - ANDROSTENEDIONE *3*

Related Drugs

Estradiol Estrogen Estropipate Ethinyl estradiol

Androstenedione might increase estrogen related side effects and risks in individuals taking estrogen. Androstenedion increases testosterone levels and improves athletic performance, women taking estrogen should avoid this drug as it could increase risk of thromboembolism, breast and uterine cancer.

ORAL CONTRACEPTIVES - LICORICE *3*

Licorice may exacerbate fluid retention experiences by those taking oral contraceptives. Patients may be at increased risk for elevated blood pressure as well.

Glycyrrhizic acid, active ingredient of licorice, inhibits 11-beta-hydroxysteroid dehydrogenase, an enzyme which metabolizes cortisol to cortisone. In consequence, intrarenal levels of cortisol rise, causing inappropriate activation of mineralocorticoid receptors. Result is hypokalemia, edema, hypertension, decreased plasma renin, decreased plasma aldosterone levels.

ORAL CONTRACEPTIVES - SOY *4*

Unlikely that soy will interact with estrogenic drugs.

ORAL CONTRACEPTIVES - ST. JOHN's WORT *2*

Related drugs:

Cyclosporine CYP3Z4 and P-glycoprotein drug substrates

HIV protease inhibitors (eg. saquinavir and indinavir)

Concomitant use of St. John's wort extract causes increased metabolism of ethinylestradiol, the estrogenic component of oral contraceptives.

It may interfere with the oral contraceptive and lead to unwanted pregnancies.

ORALLY ADMINISTERED DRUGS - PSYLLIUM *1*

Other potentially implicated herbs:

Flaxseed Ispaghula husk Marshmallow leaf root

Mullein Psyllium seed husk

Psyllium may diminish absorption of orally administered drugs because of its mucilage content used as a stool bulking agent. Lady on lithium found drug absorption decreased.

Separate oral medication by at least 2 hours from the herb to avoid impairment of medication.

PAROXETINE - ST. JOHN's WORT *2*

Related Drugs:

Citalopram Fluoxetine Fluvoxamine Nefzodone

Sertraline Sumatriptan Tramadol Trazodone

Other potentially implicated herbs:

Ayahuasca

Concomitant use of St. John's Wort and selective serotonin reuptake inhibitors (SSRIs) such as paroxetine may result in serotonin syndrome. Ayahuasca possesses alkaloids with MAO inhibitor action, may present similar risk. St. John's wort appears to act similarly to SSRIs. Serotonism is characterized by myoclonus, sweating, agitation, headache, abdominal pain, increased blood pressure, hyperpyrexia. Combined use of Paroxetine (50 mg/day) and St. John's Wort (600mg/day) resulted in weakness, fatigue, grogginess, incoherence possibly due to serotonin syndrome. Person was arousable but had difficulty getting out of bed. Symptoms resolved spontaneously over the next 2 hours. If using together, monitor and separate by at least 9 hours which is the half-lie of hyperforin (active ingredient in St. John's Wort).

PENICILLAMINE - IRON *1*
Other potentially implicated Supplements:

Copper	Ferrous fumerate	Ferrous gluconate
Ferrous sulfate	Iron polysaccharide	Zinc

Iron and other minerals may reduce the absorption of penillamine. Mineral absorption may also be reduced. Administer at least 2 hours apart from supplements.

PENICILLAMINE - MAGNESIUM *2*
Magnesium may reduce absorption of penicillamine, and vice versa. Administer 2 hours apart.

PENTOBARBITAL - EUCALYPTOL *2*
Related Drugs:

Amobarbital	Aprobarbital	Butabarbital	Mephobarbital
Methohexital	Penobarbital	Secobarbital	Thiopental

Eucalyptol used by aerosol or on the skin, increased liver metabolism of aminopyrine, p-nitro-anisol, and aniline (in vitro in rats) therefore may increase metabolism of pentobarbital and other barbiturates, hence decreasing their effectiveness. Suggest not using Eucalyptol (as an antiseptic agent or an expectorant) prior to surgery when a barbiturate may be used.

PENTOBARBITAL - VALERIAN *2)
Related Drugs:

- Amobarbital
- Aprobarbital
- Butabarbital
- CNS depressants (alcohol,phenobarbital, secobarbital)

Other potentially Implicated Herbs:

Ashwagandha	Calendula	Catnip	Hops	Kava
Lady's Slipper	Lemon balm	Passionflower	Sassafras	Skullcap
Herba mansa				

Valerian may potentiate the sedative effects of barbiturates such as pentobarbital. Take one or the other, but not both simultaneously.

PHENELZINE - EPHEDRA *1*
Related Drugs:

Isocarboxazid	Tranylcypromine

Other potentially Implicated Herbs

Black tea (caffeine content)	Green tea	Guarana	Mate
Scotch broom (tryramine content)	Yohimbine		

If used together, hypertensive crises may result.

PHENELZINE - GINSENG *2*
Related Drugs:

Isocarboxazid	Tranylcypromine

According to two case reports, combining ginseng and phenelzine may cause insomnia, headache, tremulousness. Avoid concomitant use of ginseng and phenolzine or any other MAOIs. Inactivation of phenelzine is via acetylation, with clinical effects persisting for up to 2

weeks following discontinuation of therapy; hence concomitant use should be avoided during this per of time as well. Because the half life of ginseng's relevant components is unknown, recommendation is based on this parameter can't be offered.

PHENPROCOUMON - ST. JOHN'S WORT *2*
Related Drugs:

Anisindione	**Dicumarol**	**Warfarin**

St. John's wort may reduce plasma levels of drugs in the warfarin family. If taking together, have coagulation parametered measured.

PHENYTOIN - GINKGO *2*
Related Drugs

Carbamazepine	**Gabapentin**	**Mephenytoin**	**Phenobarbital.**

Contaminants found in ginkgo might diminish the anticonvulsant activity of phenytoin and related compounds. The neurotoxic ginkgotoxin 4'-O-methylpyridoxin has been found in the seeds of Ginkgo biloba. It is an antivitamin B6, interferes with amino acid metabolism and has been associated with convulsions and death in lab guinea pigs and mice. This shouldn't be present in the ginkgo preparations for human use since they are prepared from the leaves, however a study found it even in homeopathic preparations. Highest amounts were found in late summer and early autumn. Without standardization, it is advisable not to use gingko if epileptic.

PHOSPHORUS - ALUMINUM HYDROXIDE *1*
Other potentially implicated supplements:
Calcium
Aluminum containing antacids can cause phosphorus depletion, esp. with long term use, which can lead to calcium depletion. The aluminum in aluminum containing antacids combines with phosphorus, rendering it unabsorbable. That is the basis for the use of aluminum hydroxide as a phosphate binder to treat hyperphosphatemia in hemodialysis patients. This interaction leads to a loss of both phosphorus and calcium from bones. Avoid long term use of aluminum hydroxide. If used, supplement with calcium and phosphorus. Take the antacid 2-3 hours apart from meals or supplements.

PIROXICAM - ST. JOHN'S WORT *2*
Related Drugs:

ACE inhibitors	**Amiodarone**	**Carbamazepine**	**Fluoroquinolones**
Isotretinoin	**Loop diuretics**	**Methotrexate**	**Methyldopa**
NSAIDs	**Oral contraceptives**	**Phenobarbital**	**Phenothiazines**
Risperidone	**Sulfonamides**	**Sulfonylureas**	**Tetracycline**
Thiazide diuretics	**Tricyclic antidepressants**		**Valproic acid**

Other potentially implicated herbs:
Dong quai
The hypericin component of St. John's Wort has been identified as a causative agent in the development of photosensitivity. Combination with drugs of a known propensity to induce photosensitivity such as piroxicam, may predispose the person to severe reactions. Because of its furanocoumarin content, dong quai might also cause photosensitivity.

PREDNISOLONE - LICORICE *1*
Related Drugs:

Betamethasone	**Dexamethasone**	**Hydrocortisone**
Methylprednisolone	**Prednisone**	**Triamcinolone**

Other potentially implicated herbs:

Magnolia off.	**Perillae frutescens**	**Saiboku-To**
Scutellaria baiclensis	**Zizyphus vulgaris**	

Licorice may augment effects of corticosteroids such as prednisolone, through its ability to

inhibit enzymatic metabolism of these drugs. The liver has two delta4-reductase systems: a soluble delta4-5-beta reductase and a microsomal delta4-5-alpha reductase. In humans, 5-beta reductase predominates and is physiologically significant in the regulation and metabolism of cortisol and aldosterone. Suppression of 5-beta reductase can be presumed to delay corticosteroid clearance and prolong the biological half life of cortisol. This mechanism leads to synergy between glucocorticoids and the glycerrhetinic acid and glycyrrhizin found in licorice. Be aware that the effects of corticosteroids may be enhances and prolonged if these agents are used concomitantly.

PRIMIDONE - NICOTINAMIDE *3*
Other potentially implicated supplements:
Niacin
Nicotinamide (niacinamide) may increase serum primidone levels. It may inhibit CYP450 enzymes that metabolize primidone, leading to higher drug levels. Monitor serum. The interaction might be used beneficially in some cases.

PROCYCLIDINE - BETEL NUT *1*
Related drugs

Benztropine	**Bethanechol**	**Biperiden**	**Dicyclomine**
Diphenhydramine	**Donepezil**	**Etopropazine**	**Ipratropium**
Tacrine	**Trihexyphenidyl**		

Other potentially implicated herbs:

Jimson weed	**Mandrake**	**Thorn apple**

The cholinergic activity of are choline, an active alkaloid ingredient in betel nut, may offset the activity and decrease the efficacy of anticholinergic drugs such as procyclidine. Also a potential effect might occur with cholinergic medications.
Monitor if taking both because the beneficial effects of anticholinergic drug eg. in managing Parkinson's, may be markedly diminished.

PROPRANOLOL - BLACK PEPPER *1*
Related Drugs

Phenobarbital	**Phenytoin**	**Rifampicin**	**Theophylline**

When taken in relatively high doses or in formulations that deliberately concentrate the alkaloid piperine, black pepper may inhibit the metabolism and perhaps increase the absorption of several drugs. This can be used to therapeutic advantage, and it can also predispose the person to an increased risk of side effects.

PROTEASE INHIBITORS - GARLIC
Garlic might interact unfavorably with protease inhibitors, reducing plasma levels as well as increasing risk of adverse effects. Two individuals with HIV experienced symptoms of gastrointestinal toxicity after combining ritonavir with garlic. Another study found garlic reduced plasma concentrations of saquinavir. If taking protease inhibitors, avoid use of garlic supplements.

SAMe - LEVODOPA/CARBIDOPA *3*
Levodopa may deplete endogenous SAMe. This may be responsible for some of the side effects of levodopa such as depression. However exogenous SAMe might lead to loss of efficacy of levodopa therapy in Parkinson's.
SAMe (S-adenosylmethionine) is a naturally occuring compound, derived from the amino acid methionine and the energy molecule adenosine triphosphate (ATP) that is used as a methyl donor in numerous bioligic reactions. Conversion of dopa to dopamine in the brain is the basis for using levodopa in Parkinson's. As levodopa and its product dopamine are both avid methy acceptors, it is thought that they may deplete brain levels of SAMe.

Until more is understood, avoid combining.

SIMVASTATIN/NIACIN THERAPY - ANTIOXIDANTS *2*
Related Drugs

Atorvastatin	**Cerivastatin**	**Fluvastatin**	**Lovastatin**
Pravastatin	**Simvastatin**		

Antioxidant therapy may impair the positive effects on HDL attributable to combined statin/niacin therapy.
If taking niacin plus a statin drug with the goal of raising HDL, avoid high doses of antioxidants.

SODIUM BICARBONATE
Common names: Soda Mint Tablets Sodium Bicarbonate Compound Tablets BP
Combination Drugs: Alka Seltzer Birley Bismag Bisodol Extra Strong Mint Tablets Bisodol Heartburn Releif Tablets Bisodol Indigestion Relief Powder Bisodol Indigestion Relief tablets Bisodol Wind Relief Tablets Boots Indigestion Tablets. De Witt's Antacid powder, Gaviscon 250 tablets, Opas, Roter.

Sodium bicarbonate (baking soda) is used as an antacid for short term relief of stomach upset, to correct acidosis in kidney disorders, to make the urine alkaline during bladder infections and to minimize uric acid crystallization during gout treatment. A prescription sodium bicarbonate product is given by injection to treat metabolic acidosis and some drug intoxications. Sodium bicarbonate is available as a non prescription drug alone, or in combination with other non prescription drugs for short term treatment of various conditions to treat fever andmild to moderate pain.

Folic Acid
Folic is needed by the body to utilize vit. B12. Antacids, including sodium bicarbonate, inhibit folic acid absorption. Supplement B12 as needed.

Iron
In a study of 9 healthy people, sodium bicarbonate administered with 10 mg iron, led to lower iron levels compared to iron administered alone.

SODIUM FLUORIDE
Common names: En-De-Kay Fluotabs, Fluor-a-Day, Fluorigard, Fluorinse, Fluoritab, Flurodex, Fluotic, Flura-Drops, Flura-Tab, Karidium Luride, Pedi-Dent, Pediaflor, PreviDent.
Sodium fluoride is used to prevent dental cavities and might be effective in treatment of osteoporosis.

Calcium
Research shows that calcium form leg bones may be transferred to bones in the spine causing stress fractures when fluoride is taken alone. However, supplementing with 1,500 mg of calcium each day together with slow-release forms of fluoride increases the bone density of the lumbar spine without causing fractures. Take fluoride and caldium at least an hour apart for best absorption.

Vit. D
Collagen is a protein that is used in many areas o the body for structural support. One test tube study showed that the active form of Vit. D, 1,25 dihydroxycholecalciferol, increased the production of a certian type of collagen when it was combined with fluoride. Controlled research is needed to determine whether taking1,25 dihydroxycholecalciferol with sodium fluoride might promote beneficial collagen growth.

Zinc
Individuals who are bedridden for long periods may become deficient in zinc, which can affect the strength of bone that is formed. In a controlled study of healthy adults who were confined to bed, fluoride suppplementation prevented zinc loss from the body. Bedridden individuals

should consult a qualified healthcare practitioner for guidance in using fluoride to prevent zinc deficiency.

Vitamin E

Vit. E increases the resistance of tooth enamel to acids that cause cavities, and test tube studies show that fluoride, when added to Vit. E, enhances this effect. Controlled research is needed to determine whether people might develop fewers cavities when taking vit E and fluoride together.

Food

Taking sodium fluoride with food or dairy products reduces the absorption of themineral. Therefore, sodium fluoride should be taken an hour before or two hours after a meal, or any snack containing milk, ice cream, yogurt or cheese.

Tea

Many compounds in ea, such as tannin, catechin and caffeine can increase the resistance of tooth enamel to acids that cause cavities and test tube studies show that fluoride when added to these compounds, enhances this effect. Controlled research is needed to determine whether drinking tea might further reduce the number of cavities in people taking fluoride.

SPIRONOLACTONE - LICORICE *1*

Related Drugs

Amiloride Triamterene

The effects of spironolactone may be diminished by coadministration of licorice. Conversely, spironolactone may offset the deleterious effects of excessive licorice intake.

ST. JOHN'S WORT

Avoid similar actions of Alcohol, Anti-anxiety agents, Muscle Relaxants

STATIN DRUGS -NIACIN *2*

Related Drugs

Atorvastatin Cerivastatin Fluvastatin Lovastatin
Pravastatin Simvastatin

The additino of niacin to statin therapy improves HDL levels. Concerns about increased risk of myopathy and rhabdomyolysis have been reduced by the results of recent studies. Lovastatin therapy is associated with a relatively small risk of myopathy. At one time, myopathy was reported to occur in up to 5% of patients taking lovastatin and high-dose niacin together, since then controlled trials using statin drugs with niacin have reported few or no cases of myopathy. If symptoms of myopathy such as unusual muscle pain or weakness, occur if taking niacin and statin, measure plasma creatin kinase levels to confirm the diagnosis and discontinue drug therapy if needed.

TAMOXIFEN -TANGERETIN *2*

Tangeretin, a citrus flavonoid present in tangerines, may interfere with the effectiveness of tamoxifen. In vitro, tangeretin shows effects similar to tamoxifen in supressing human mammary cancer cells, and a combination of the two shows additive benefits. Counsel against excessive intake of tangeretin during tamoxifen therapy.

TETRACYCLINES - IRON *3*

Related drugs:

Demeclocycline Doxycycline Methacycline Minocycline
Oxytetracycline Tetracycline

Other potentially implicated supplements:

Calcium Magnesium Zinc

Numerous metallic mineral salts bind with tetracycline antibiotics and interfere with their absorption, potentially resulting in diminished antibiotic efficacy. Mineral absorption is likewise reduced. Minerals known to interact with tetracyclines include calcium, madnesium, iron and zinc. Other minerals may also interact.
Tetracyclines form insoluble chelates with polyvalent metal cations including iron, calcium, magnesium and zinc. Result is reduced absorption of both the antibiotic and mineral.
In one study, ferrous sulfate (40 mg elemental iron) reduced serum levels of tetracycline and oxytetraclcline, significantly more than methacycline and doxycycline, compared to control (without iron).
Zinc may reduce absorption or bioavailability of Tetracycline.
The severity of an interaction depends on the particular tetracycline derivative and the formation of the cation, the doses, dosing schedules and pharmaceutical factors. For instance, ferrous sulfate capsules may reduce tetracycline absorption more than tablets, while enteric coated iron preparations reduce absorption less than regular tablets. The interference also appears to be less with sustained release iron formulations. Both ferrous and ferric iron bind with tetracycline, with the ferric form binding stronger. In one study, co-adminsitration of 200mg of ferrous sulfate caused plasma levels of tetracydcline derivaties to be decreased by as much as 80-90%. Taking iron 3 hours before or 2 hours after the antibiotic prevented the problem.
Conversely, tetracycline interferes with iron absorption by as much as 30-40% when tetracycline of 500mg was given simultaneously with 50 mg ferrous iron.
Milk, being calcium rich, inhibits the absorption of tetracycline, doxycycline and oxytetracycline, but serum concentrations of these antibiotics appear to remain in the therapeutic range to be more substantial.
Similar interactions have been reported with zinc. Antacids containing aluminum, magnesium, or calcium have been found to substantially decrease the absorption of all tetracyclines.
Take tetracyclines 3-4 hours apart from milk, dairy products and supplements contain metallic cations.

Bromelain

Taking bromelain with tetracycline will increase the concentration of tetracycline in the bloodstream thus increasing the risk fo allergic reactions to the antibiotic.

THEOPHYLLINE - IPRIFLAVONE *1*
Related Drugs

Aminophylline	**Dyphylline**	**Ostriphylline**	**Phenytoin**
Tolbutamide	**Warfarin**		

Through CYP interactions, ipriflavone might increase serum levels of theophyline and other drugs metabolized by CYP1A2 or CYP2C9, causing risk of toxicity.
Ipriflavone, a synthetic isoflavone that inhibits bone resorption, is used to treat osteoporosis. It may inhibit certain CYP liver enzymes and this may lead to increased serum levels of some drugs. Someone taking drugs for asthma or pulmonary disease as well as osteoporosis might conceivably be taking both types of drugs.

THEOPHYLLINE - ST. JOHN'S WORT *2*
Related Drugs

Clomipramine	**Clozapine**	**Imipramine**	**Olanzapine**

St. John's wort may stimulate the metabolism of theophylline, resulting in greater dosage requirements for theophylline. However, abrupt discontinuation of St. John's Wort by a patient stabilized on theophylline may lead to toxic, supratherapeutic theophylline levels.
Given the rarity of using theophylline concomitantly with St. John's wort, but avoid the interaction.

THYROID HORMONE - CALCIUM *1*
Related drugs

Dextrothyrozine	**Levothyroxine**	**Liotrix**

Liothyronine Thyroglobulin

Calcium carbonate may interfere with the absorption of levothyroxine, possibly posing a risk of hypothyroidism. Calcium supplements are commonly taken for preventing osteoporosis, it should be taken at a different time of the day. Monitor thyroid for hypothyroidism.

THYROID HORMONE - CARNITINE *3*

Related Drugs

Dextrothyroxine Levothyroxine Liothyronine
Liotrix Thyroglobulin

Evidence that carnitine partially blocks action of thyroid hormone making it a pheripheral anatagonist of TH action, acting at or before the nuclear envelope.
Trial was done on 50 women with goiters who were taking exogenous T4 to suppress TSH2. Given carnitine or placebo, carnitine group showed greater reductions on a 5 point scale of hyperthyroidism

THYROID HORMONE - IRON *1*

Related drugs

Dextrothyroxine Levothyroxine Liothyronine
Liotrix Thyroglobulin

Related supplements

Ferrous fumerate Ferrous gluconate Ferrous sulfate
Iron polysaccharide

Iron salts may impair the effect of levothyroxine, probably by forming a complex with the thyroid hormone and decreasing its absorption.
Trial of 14 people with hypothyroidism found TSH concentrations increased. Take iron salts as far apart as possible from levothyroxine and monitor thyroid function to adjust dose of levothyroxine.

THYROID HORMONE - SOY *2*

Related Drugs

Dextrothyroxine Levothyroxine Liothyronine
Liotrix Thyroglobulin

Soy & soy derived products may interfere with thyroid hormone absorption and thyroid function.
Soy formula may interfere with the absorption of thyroid medication in infants. Additionally, soy may directly interfere with thyroid function. The result may be a need to increase the infant's dosage of thyroid medication. However, if infant soy formula is then discontinued, the thyroid dosage may need to be decreased.
Based on these findings individuals with impaired thyroid function should use soy products with caution.

TRIMETHOPRIM - SULFAMETHOXAZOLE - PABA *2*

Related Drugs

Dapsone (DDS) Sulfonamides sulfones

The antimicrobial effects of sulfonamides and sulfones may be impaired by supplementation with para-aminobenzoic acid (PABA).
Microorganisms that must synthesize their own folic acid are susceptible to certain sulfones and sulfonamides, which appear to work by competitively displacing PABA from its binding site on an enzyme that catalyzes a key step in the biosynthesis of folic acid. For this reason PABA supplementation may reverse the antimicrobial action of these agents.
Investigations involving human volunteers subjected to mosquito-induced infections found that the antimalarial effects of the sulfone dapsone (DDS) were impaired by PABA supplementation. Either dapsone alone or dapsone in combination with PABA was given to 39 volunteers not previously exposed to malaria, then the subjects were bitten by infected mosquitoes. Infection was suppressed in 19 of 23 volunteers given dapsone, 25 mg and 50mg daily, beginning before

exposure to infected mosquitoes and continuing 1 month after exposure. In contrast, all 5 volunteers given PABA, 4 g/day (1 g every 6 hours), and dapsone, 25 mg/day, beginning on the day before bitten, suffered acute attacks of malaria.

TRIMETHOPRIM - SULFAMETHOXAZOLE - POTASSIUM *3*
Combining potassium with this drug may cause hyperkalemia. It is known to occur with high dose trimethoprim in those with AIDS. Trimethoprim is structurally similar to the potassium sparing diuretic amiloride which inhibits distal tubule sodium reabsorption and potassium secretion and this is thought to be the probably mechanism for the development of hyperkalemia. If the patients are doing a high potassium diet or taking supplementation, monitor the serum potassium concentrations and adjust potassium intake as needed.

VALPROIC ACID
Valproic acid (official name 2-propylvaleric acid) was first synthesized in 1882 by Burton as an analogue of valeric acid, found naturally in Valerian.
Anti-seizure medicine.
Do not take with Kava
Beneficial to supplement with: Vit. E, selenium, biotin, Calcium, Carnitine, Copper and Zinc, Folic acid, Vit. A, B6,B12, D,K

VITAMIN A - VALPROIC ACID *2*
Related Drugs

Barbiturates	**Carbamazepine**	**Divalproex sodium**
Ethosuxmide	**Phenobarbital**	**Phenytoin**
Primidone	**Valproate sodium**	

Valproic acid and other anticonvulsants increase the risk of birth defects, perhaps by altering endogenous retinoid metabolism. It is possible that coadministration with supplemental vit. A could increase this risk. Anticonvulsants as a class have been associated with teratogenic effects when administered during pregnancy. The numerous proposed mechanisms include one involving the effects of those drugs on Vit. A (retinol) metabolism. Vit. A and its metabolite, esp. all trans retinoic acid, play a significant role in many embryonic development processes. Both excess and deficiency of Vit. A have been associated with teratogenic effects and alterations in related plasma retinodis might also be harmful.
One study involving 75 infants and children taking various anticonvulsant agents and 29 untreated controls found significant alterations in the levels of retinol and some isomers and oxidative metabolites of retinoic acid. Valproic acid monotherapy, in particular, increased retinol levels in the young age group. Conversely, plasma levels of two oxidative metabolites of retinoic acid were strongly decreased in all patient groups treated with phenytoin, phenobarbital, carbamazepine, and ethosuximide, in combination with valproic acid, compared to controls.
These effects on endogenous retinoid metabolism may be related to the tertogenesis (deformities) observed with anticonvulsant agents. Whether combining Vit. A and anticonvulsants increases the risk of teratogenesis, remains unclear. It might be advisable to avoid coadministering anticonvulsants and Vit. A during early pregnancy to be on the safe side.

VERAPAMIL - CALCIUM *1*
Related Drugs

Amlodipine	**Bepridil**	**Diltiazem**	**Felodipine**
Isradipine			

Other potentially implicated Supplements:
Vitamin D
Calcium salts may antagonize some of the effects of calcium channel blockers. Most of the evidence relates to calcium infusion; however, oral calcium esp when combined with Vit. D might produce a similar effect. Vit.D potentiates the effects of oral calcium by increasing its absorption and utilization. Administration of IV calcium salts may be used therapeutically to reverse some of the cardiac depressant effects of verapamil and possibly other calcium channel

blockers. Conversely, those on calcium channel blockers who take calcium or vit. D supplements should be closely monitored for reduced effectiveness of the treatment.

VITAMIN B1 (Thiamine) - LOOP DIURETICS *2*
Related Drugs

Bumetanide Ethacrynic acid Furosemide Torsemide

Loop diuretics as well as other factors may contribute to Vit. B1 deficiency in those with congestive heart failure (CHF). Thiamine deficiency has been reported to occur in 20% of CHF receiving furosemide, 80-240 mg for 3-14 months, compared to age matched patients without heart failure and not taking diuretics. Many with CHF have poor nutrition due to illness related loss of appetite or age, also low sodium diets avoid many foods that would contribute dietary thiamine.
Thiamine supplementation may prevent or correct thiamine deficiency and improve cardiac function in those with CHF.

VITAMIN B2 (Riboflavin) - ORAL CONTRACEPTIVES *3*
Oral contraceptives may deplete Vit. B2 to some degree esp. if oral contraceptives are taken for a long period of time. Supplementation at standard doses may be advisable on general principles.

VITAMIN B6 (Pyridoxine) - ISONIAZID
Related drugs:

Hydralazine Isocarboxazid Phenelzine

Isoniazid interferes with pyridoxine activity. This effect appears to be dose related, can lead to the development of peripheral neuritis caused by pyridoxine deficiency. A possible complicating factor is that excessive supplemental pyridoxine may blunt the therapeutic effects of isoniazid. Hydralazine, phenelzine and isocarboxazid are structurally similar and may affect pyridoxine similarly. Isoniazid is a hydrazine that forms a hydrazone with pyridoxal-5-phosphate (the active form of pyridoxine), inhibiting its coenzyme action.
Consider administering 6-50mg a day of B6 with izoniazid to prevent drug induced peripheral neuropathy.
Note, long standing neuropathies caused by drug induced pyridoxine deficiency may not respond to B6.

VITAMIN B6 (Pyridoxine) - LEVODOPA *3*

- **Pyridoxine in larger doses can reduce therapeutic effects of levodopa in Parkinson's.**
- **Recommended daily intake for B6 in adults is 2 mg for men and 1.6 mg for women. In doses of 5-25 mg, it has been reported to reduce the therapeutic effects of levodopa.**
- **Conversion of dopa to dopamine in the brain is the basis for using levodopa (L-dopa) in parkinson's disease. B6 appears to accelerate the peripheral metabolism of levodopa todopmine and degration products, leaving less levodopa available for conversion to dopamine in the brain.**
- **Dopamin in the peripheral circulation does not cross the blood brain barrier. Because this interaction appears to occur only with larger pyridoxine doses, recommendation of pyridoxine deficient diet in patients taking levodopa is probably unnecessary and could lead to B6 deficiency with its own adverse effects.**
- **Carbidopa, which is usually given with levodopa, has the opposite effect of B6 and generally neutralizes the vitamin's effect on levodopa. However this neutralizing effect may depend to some degree on the doses of carbidopa and pyridoxine.**

VITAMIN B6 (Pyridoxine) - ORAL CONTRACEPTIVES *4*
Sometimes reported that oral contraceptives may adversely affect B6, however more recent studies have not found such an effect.

VITAMIN B6 (Pyridoxine) - PENICILLAMINE *3*
Indirect evidence suggests that penicillamine therapy could reduce pyridoxine deficiency. Although penicillamine appears to deplete pyridoxine, this effect may be clinically important only in those with poor nutritional status. Because B6 deficiency is relatively common, supplementation in standard nutritional doses may be advisable on general principles.

VITAMIN B6 (Pyridoxine) - THEOPHYLLINE *3*
Related drugs
Aminophylline Dyphylline Oxtriphylline
Long term theophylline treatment may deplete body stores of pyridoxine. Pyridoxal kinase metabolizes pyridoxine to its active form, pyridoxal-5-phosphate (PLP). Theophylline is a pyridoxine antagonist, due to its potent inhibition of pyridoxal kinase.
Suggest supplementation of B6 (10-15 mg/day is normal). Evidence also that B6 (higher doses) may reduce theophylline related hand tremor as well some of the other side effects of Theophylline.

VITAMIN B12 - COLCHICINE *3*
Chronic use of colchicine can impair intestinal absorption of B12.
Absorption studies using the Schilling test in 20 participants taking oral colchicine found significantly reduced B12 absorption in all but one subject. No effect on intrinsic factor was observed; most likely mechanism is colchicine's effect on the ileal site of B12 absorption. Monitor B12 and supplement as needed.

VITAMIN B12 - H2 ANTAGONISTS *2*
Related Drugs
Cimetidine Famotidine Lansoprazole Nizatidine Omepreazole Ranitidine
H2 antagonists and other drugs that inhibit gastric acid secretion may reduce the absorption fo B12 from foods. However, the absorption of oral B12 supplements should not be affected. Adequate stomach acid and pepsin are required to free cobalamin (Vit. B12 from its dietary protein bound form. Vit. B12 is then attached to intrinsic factor which allows the vitamin to be absorbed in the intestines. The H2 antagonist cimetidine given 4 times dail (1,000 mg total) reduced the absorption of dietary B12 in both peptic ulcer patients and normal subjects. 400mg of cimetidine given at night had no significant effect.

VITAMIN B12 - METFORMIN *3*
Related Drugs
Pheformin
The biguanide oral hypoglycemia drugs metformin and phenformin may cause malabsorption of B12. These drugs are known to be associated with malabsorption of B12. Of 46 randomly selected diabetic patients, 30% were found to have malabsorption of B12 that were taking biguanide. No severe deficiency has been found. Once the drug was stopped, half of those with malabsorption recovered, the others did not.
This is of concern because the peripheral neuropathy associated with diabetes may be indistinguishable from that associated with B12 deficiency. It is advisable to monitor B12 levels if patients are taking metformin or phenformin and keep in mind that discontinuation of the drug may not restore normal B12 absorption. Based on recent evidence, increased calcium intake may be advisable to help prevent biguanide induced B12 malabsorption.

VITAMIN B12 - NITROUS OXIDE *1*
Other potentially implicated supplements:
Folic acid (folate)
Nitrous oxide can inactivate B12 and cause neurologic deterioration in those with existing vit. B12 deficiency. Secondary folate deficiency may also develop. Abundance evidence. Nitrous oxide irreversibly oxidizes reduced cobalt to he Co2 and Co3+ forms, and renders B12 inactive. This in turn reduces the activity of the cobalamin dependent enzyme methionine synthetase,

resulting in decreased production of methionine as well as tetrahydrofolate, which is required in DNA synthesis.
Inactivated vit. B12 is normally rapidly replaced, but not in individuals with existing B12 deficiency. Short term exposure to nitrous oxide in healthy individuals appears to cause no significant problems. Long term exposure can produce megaloblastic anemia and neurologic changes. Alert anesthesiologists. Supplement when necessary. Professionals regularly exposed to nitrous oxide may be at risk.

VITAMIN B12 - ORAL CONTRACEPTIVES *4*
Women taking oral contraceptives frequently have lower serum B12 levels than those not using them. However total B12 stores apparently remain normal in OC users and B12 deficiency may be unlikely to occur. Under normal circumstances B12 supplementation may not be necessary.

VITAMIN C - ASPIRIN *3*
Aspirin may deplete body stores of Vit. C, possibly leading to subclinical scurvy and increasing risk of abnormal bleeding episodes.
Blood platelets need Vit. C to clot normally. Low Vit. C levels could enhance aspirin's anticoagulant effect and increase the risk of hematemesis or other abnormal bleeding episodes. Supplementation with Vit. C may be beneficial during chronic aspirin therapy.

VITAMIN C - ORAL CONTRACEPTIVES *3*
Oral contraceptives may depress blood levels of Vit. C Itisn't clear whether today's low estrogen Oral Contraceptives would produce the same effect as those demonstrated by in 1972 when it was determined.

VITAMIN D - CIMETIDINE *3*
Cimetidine may interefere with Vit. D metabolism. Other H2 antagonists may be unlikely to interact.
Vitamin D is converted to its major circulating metabolite, 25-hydroxyvitamin D (25-OHD) by the hepatic microsomal enzyme Vit. D-25-hydroxylase. Cimetidine is known to inhibit several microsomal oxidase enzymes. If the drug inhibits Vit. D-25-hydroxylase, it would be expected to lower blood levels of 25-OHD.
Nine adults were given 400 mg of cimetidine BID for 4 wk during seasonal change from winter to summer when the days are becoming longer. Though cimetidine did not lower the levels of 25-PHD, it did prevent the expected seasonal rise in these levels. Levels of 25-OHD increased significantly after cimetidine was stopped. Watch long term use of cimetidine causing Vit. D shortage and supplement accordingly.

VITAMIN D - HEPARIN *1*
High dose or long term use of heparin may interfere with the physiologic conversion of dietary Vit. D to its most active form. Result of this interference may be bone demineralization leading to osteoporosis. In pregnant women, heparin therapy has been associated with fractured and colapsed vertebrae.
Supplement Vit. D and calcium to help prevent heparin induced osteopososis and monitor bone density during long term therapy.

VITAMIN D - ISONIAZID *3*
The anti-tuberculosis drug isoniazid may interfere with the acivity of Vit. D, leading to decreased blood levels of calcium and phosphate. However, homeostatic mechanisms may make these effects clinically unimpoirtant with long term therapy. The same seems to be the case for comination anti-tuberculosis therapy with isoniazid and rifampin.
Isoniazid appears to inhibit the hepatic and renal hydroxylase enzymes needed to form 2 Vit. D metabolites; 1,25dihydroxyvitamin D or 1,25 (OH)2D, the most active Vit. D metabolite, and its precursor 25-hydroxyvitamin D (25-OHD), the major circulating metabolite.
A 14 day study in 8 healthy men found that isoniazid (300mg/day) produced a consistent fall in serum levels of calcium and phosphate over a 2 week period, but homeostatic mechanisms

restored levels to normal. After a single isoniazid dose 1,25(OH)2D levels fell by 47% and were reduced throughout the study. Levels of 25-OHD also declined, though much more slowly. However, the resultant relative hypocalcemia stimulated parathyroid hormone levels to rise by 35%; that response, combined with other homeostatic mechanisms tended to bring mineral blood levels back into balance, suggesting that the clinical effect of the interaction may be small.
Monitor patients carefully if they have compromised calcium homeostatis.

VITAMIN D - PHENYTOIN *2*
Related Drugs:

Carbamazepine	**Ethotoin**	**Mephenytoin**	**Phenobarbital**
Primidone	**Valproic acid**		

- **Phenytoin and other anticonvulsant drugs (including phenobarbital, primidone, and carbamazepine) that induce hepatic enzymes may interfere with Vit. D activity and thereby impair calcium utilization. Valproic acid may also be implicated through a different mechanism.**
- **This interference may increase the risk of osteoporosis and related bone disorders.**
- **Chronid therapy with phenytoin and other anticonvulsants is associated with bone related problems such as rickets in children and osteomlacia (adult rickets). These agents are known to induce the hepatic metabolism of a number of drugs and appear likewise to induce the metabolic inactivation of Vit. D. They may also reduce calcium levels by direct effects on parathyroid hormone and calcium absorption.**
- **Although an alteration in Vit. D metabolism is generally thought to account for the decreased calcium levels observed with anticonvulsant therapy, Weinstein et al reported that anticonvulsant induced hypocalcemia could occur independently of effects on Vit. D metabolism.**
- **Disorders of mineral metabolism should be ruled out before starting anticonvulsant therapy. In many cases, adequate sun exposure may compensate for anticonvulsant induced impairement of Vit. activity. Otherwise, Vit. D supplementation may be warranted.**

VITAMIN D - RIFAMPIN *3*
The antituberculosis drug rifampin may interfere with the activity of Vit. D. This may not be clinically significant in most cases. If a person already has compromised calcium homeostatis or Vit. D nutriture, carefully monitor while taking rifampin alone or in combination with isoniazid.

VITAMIN K - AMOXICILLIN *4*
Related Drugs:

Fluroquinolones	**Macrolides**	**Penicillins**
Sulfonamides	**Tetracyclines**	

- **Weak evidence, but antibiotic treatment might impair Vit. K status in those with existing low Vit. K levels. It is widely believed that antibiotics can cause Vit. K deficiency by suppressing Vit. K producing gut flora, but convincing evidence is lacking. In a review Lipsky found no definitive evidence that intestinal bacteria are an important nutritional source of Vit. K and therefore their suppression by broad-spectrum antibiotics might not even affect vit. K levels.**
- **However there is at least some support for the idea. An analysis of postmortem human liver samples appears to provide indirect evidence that the from of Vit K produced by bacteria is absorbed from the distal intestinal tract and might play a significant role in meeting vit. K requirements in the absence of dietary Vit. K. Of the 22 deceased, 9 had been ill and were receiving broad spectrum antimicrobials and 13 were apparently healthy individuals who were victims of unexpected sudden death. No significant differences were found in average hepatic phylloquinone (dietary vit K) content between the two groups; however there was a significant reduction in total hepatic menaquinone (bacteria produced Vit K) content in the antibiotic treated group compared to the other group. If symptomatic vit. deficiency due to he effects of antibiotics on gut flora does occur, i is probably limited to those individuals with preexisting low vit. K levels. In any case, patients with adequate nutrition status maintain normal prothrombin times regardless of the antibiotic administered.**

- **It may be advisable to give Vit. K or to monitor prothrombin times in patients with low Vit K stores caused by malnutrition, malabsorption or total parental nutrition which are treated with an antibiotic, particularly a cephalosporin containing the methyltetrazolethiol side chain.**

VITAMIN K - CEPHALOSPORINS *3*
Related Drugs:

Cefamandole	**Cefazolin**	**Cefonicid**	**Cefoperazone**
Cefotaxime	**Cefotetan**	**Cefoxitin**	**Ceftazidime**
Ceftizoxime	**Ceftriaxone**	**Cefuroxime**	**Cephlothin**
Cephapirin	**Cephradine**		

- **Cephalosporins may impair Vit. K dependent blood clotting in patients with Vit. K poor diets possibly leading to bleeding complications.**
- **Cephalosporins with a methyltetrazolethiol side chain (eg. cefazolin, cefmetazole, cefoperazone, and cefotetan) may prolong prothrombin time, possibly leading to bleeding complications.**
- **The mechanism appears to be the antibiotic induced inhibition of hepatic Vit. K - Vit. K epoxide cycle, probably by interference with Vit. K epoxide reductase activity, similar to the way anticoagulants such as warfarin work but to a lesser extent. This metabolic cycle produces the active Vit. K quinol form. Cephalosporin-induced inhibition of the cycle appears to be relatively weak, because a diet providing adequate Vit. K is usually enough to overcome it.**
- **Not all findings support the importance of the methyltetrazolethiol side chain in this potential interaction. An observational study of 546 critically ill patients suggested that this side chain alone may not be an independent risk factor for increased bleeding tendency. Data from another human study indicate that methyltetrazolethiol side chain antibiotics may not affect blood clotting any more than other antibiotics, suggesting that the clotting impairment observed among patients receiving these antibiotics must be more complex and may be dependent on a number of unidentified factors.**
- **Other investigation showed that low nutritional vitamin K predisposes to antibiotic induced blood clotting impairment.**
- **Another study showed no adverse clotting effects in nine well nourished patients with normal serum Vit. K levels. Another study suggests a firm connection between malnutrition and antibiotic induced blood clotting impairment.**
- **It is widely believed that antibiotics in general may cause Vit. K deficiency by suppressing Vit. K producing gut flora, but convincing evidence is lacking. It may be advisable to give Vit. K or monitor prothrombin times with those low in Vit. D because of malnutrition, malabsorption or total parental nutrition who are treated with cephalosporin, particularly one containing the methyltetrazolethiol side chain. This interaction may not be significant in well nourished patients with normal plasma Vit. D levels.**

VITAMIN K - PHENYTOIN *2*
Related Drugs:

Carbamazepine	**Ethotoin**	**Mephenytoin**
Phenobarbitol	**Primidone**	

Phenytoin and other anticonvulsants that induce hepatic enzymes may interfere with Vit. K activity and cause a Vit. K deficiency in infants born to mothers taking these drugs. This may result in bleeding disorders or facial bone abnormalities.
By inducing microsomal oxidase enzymes, phenytoin increases the metabolic breakdown of Vit. K. This may in turn lead to Vit. K deficiency in neonates exposed to anticonvulsant drugs prenatally, according to 2 studies.

WARFARIN - COENZYME Q10 *2*
Related Drugs

Anisindione	**Dicumarol**

Coenzyme Q10 may interfere with the anticoagulating effects of warfarin.
CoQ10 is chemically related to menaquinone (Vit. D2) and may possess procoagulational effects.
In rates CoQ10 antagonism has been shown to increase prothrombin time. Conversely CoQ10 may have vit. K antagonist actions in vitro, but this effect has not been confirmed in vivo.

Avoid this combination or carefully monitor coagulation parameters and adjust the warfarin dose as needed.

WARFARIN - DANSHEN *1*

Related Drugs

Anisindione	**Dicumarol**

- **Case reports and animal studies suggest patients previously stabilized on warfarin may experience a significant increase in their prothrombin times if danshen is added to their regime.**
- **One case report suggests that a combination of the herbs boldo and fenugreek might also have the same effect.**
- **Danshen, a Chinese folk medicine, is the root of Salvia miltorrhiza. In traditional Chinese medicine, it is used for treatment of coronary artery disease.**
- **In 3 reported cases, severe overanticoagulation and bleeding complications developed when patients on chronic warfarin therapy started using danshen.**
- **A danshen preparation in concentration of 2 g/ml was administrered to 10 rates at a fixed dose of 5 g/kg intraperitoneally twice daily versis saline controls. After 3 days, warfarin was administered orally as a single dose (2 mg/kg). Danshen was not found to have any independent effect on coagulation but it did increase the PT in patients on warfarin from 41.1 to 49.9. The PT returned to normal within 3 days following discontinuation of danshen.**
- **Because warfarin is a drug with a narrow therapeutive window having little margin for error, it is recommended to advise patients to avoid concomitant use until more data is available.**

Related Drugs:

Anisindione	**Dicumarol**

Other potentially implicated Supplements:

Chamomile	**Dandelion**	**Horse chestnut**	**Red Clover**

Dong quai may potentiate the anticoagulant activity of warfarin, possibly due to its phytocoumarin content. Other herbs with high levels of phytocoumarins mentioned above, have similar risks.

Concurrent administration may result in disrupted anticoagulation control. The PT and bleeding times of these patients should be closely monitored.

WARFARIN - FEVERFEW *2*

Related Drugs:

Abciximab	**Alteplase**	**Anagrelide**	**Anisindione**
Ardeparin	**Aspirin**	**Cilostazol**	**Clopidogrel**
Dalteparin	**Danaparoid**	**Dicumarol**	**Dipyridamole**
Enoxaparin	**Eptifibatide**	**Heparin**	**Lepirudin**
NSAID's	**Pentoxifylline**	**Reteplase**	**Streptokinase**
Ticlodipine	**Tirofiban**	**Urokinase**	

- **Feverfew might enhance the anticoagulant effect of warfarin.**
- **Feverfew inhibits platelet activity. By neutralizing sulfhydryl groups, feverfew and one of its active components, parthenolide, inhibited the capacity of platelets to aggregate in an in vitro study utilizing venous blood from healthy volunteers. Makheja and Bailey concluded that feverfew antiplatlelet effects were secondary to the phospholipase inhibitor preventing arachidonic acid release.**
- **Despite these findings no clinical evidence exists.**
  Include feverfew in your list of herbs to inquire about if the patient previously stabilized on warfarin begins to experience symptoms associated with increased anticoagulation. It would be prudent to obtain a bleeding time to ascertain if platelet function has been adversely affected, esp. if the INR/PT is within the normal range.

WARFARIN - GARLIC *1*

Related Drugs:

Abciximab	**Alteplase**	**Anagrelide**	**Anisindione**
Ardeparin	**Aspirin**	**Cilostazol**	**Clopidogrel**

Dalteparin	**Danaparoid**	**Dicumarol**	**Dipyridamole**
Enoxaparin	**Eptifibatide**	**Heparin**	**Lepirudin**
NSAID's	**Pentoxifylline**	**Reteplase**	**Streptokinase**
Ticlodipine	**Tirofiban**	**Urokinase**	

Garlic may potentiate the anticoagulant activity of the warfarin and other drugs that affect hemostatis.
Allicin, an active breakdown product of fresh garlic, has been shown to inhibit platelet aggregation. Ajoene, another active component of garlic, has also been shown to inhibit platelet aggregation in a dose-dependent manner that synergistically potentiates the inhibition of aggregation by indomethacin and dipyridamole. Ajoene was found to inhibit prostaglandin synthetase.
Garlic reduced the formation of thromboxane from exogenous arachidonate, inhibited the formation of thromboxane and lipooxygenase products formed in platelets preincubated with arachidonate, inhibited the phospholipase activity and inhibited the incorporation of arachidonate into platelet phospholipids. The uptake of calcium into platelets was inhibited, lowering cytosolic calcium concentrations. Garlic oil inhibited platelet adhesion on polycarbonate surfaces by approx. 50%. In another study collagen induced platelet aggregation was not influenced by dried garlic in 20 patients with hyperlipoproteinemia.
Concomitant use of garlic and warfarin should be avoided.

WARFARIN - GINGER *2*
Related Drugs

Abciximab	**Alteplase**	**Anagrelide**	**Anisindione**
Ardeparin	**Aspirin**	**Cilostazol**	**Clopidogrel**
Dalteparin	**Danaparoid**	**Dicumarol**	**Dipyridamole**
Enoxaparin	**Eptifibatide**	**Heparin**	**Lepirudin**
NSAID's	**Pentoxifylline**	**Reteplase**	**Streptokinase**
Ticlodipine	**Tirofiban**	**Urokinase**	

- **Ginger might augment the anticoagulan acivity of warfarin. Ginger has been found to inhibit platelet**
- **aggregation and alter arachidonic metabolism. This translates into inhibition of thromboxane synthetase with decreased production of proaggregatory thromboxane. It also causes a rise in prostacyclin levels which inhibits aggregation.**
- **Studies have not found any platelet effect when ginger is administered orally. However, if combined with**
- **other drugs that may affect platelet function, such as dipyridamole, ticlopidine and clopidogrel, additive effects might occur. If combined with other drugs that affect hemostasis such as warfarin, dicumarol, and anisindione, increased anticoagulation might develop.**
- **Theoretically ginger may augment the anticoagulant and antiplatelet acivities of oher drugs. This however has not been observed or monitored for in humans. Monitor frequently as needed.**

WARFARIN - GINKGO *1*

Abciximab	**Alteplase**	**Anagrelide**	**Anisindione**
Ardeparin	**Aspirin**	**Cilostazol**	**Clopidogrel**
Dalteparin	**Danaparoid**	**Dicumarol**	**Dipyridamole**
Enoxaparin	**Eptifibatide**	**Heparin**	**Lepirudin**
NSAID's	**Pentoxifylline**	**Reteplase**	**Streptokinase**
Ticlodipine	**Tirofiban**	**Urokinase**	

Ginkgo may exacerbate the anticoagulant activity of warfarin and other agents that affect hemostasis. Several cases reported suggesting ginkgo can adversely affect hemostatis, due to content of ginkgolide B, a potent inhibitor of platelet activating factor. Suggest a temporal relationship between Ginkgo ingestion and abnormalities in platelet function. To further the abnormalities in hemostatis with the addition of an anticoagulant such as warfarin is fraught with risk.

WARFARIN - GINSENG (PANAX GINSENG) *2*

Related Drugs

Anisindione	**Dicumarol**

- **Panax ginseng might decrease the effectiveness of warfarin.**
- **A single case report exists detailing a decrease in warfarin's effectiveness with concomitant use of ginseng.**
- **Panaxynol and ginsenosides Ro, Rg1, and Rg2 have been found to have antiplatelet effects and may explain the occurrence outlined above. However a study in rats found no pharmacokineic or pharmacodynimic interaction between Ginseng and Warfarin.**
- **Because of the narrow therapeutic window of warfarin, it would be producent for the patient not to use any other drugs, over the counter products or herbal medicines without consulting a pharmacist or physician. If a patient experiences a sudden decrease in the INR/PT despite continued therapy, the clinician should question the patient regarding ginseng use.**

WARFARIN - PAPAYA EXTRACT *2*

Related Drugs

Anisindione	**Dicumarol**	**Heparin**

Other potentially implicated supplements

Boldo	**Fenugreek**

Concomitant use may result in elevated international normalized ration (INR) and prothrombin time. One case report suggests that a combination o the herbs boldo and fenugreek potentiated the effects of warfarin.

Concomitant use of papain, boldo or fenugreek with anticoagulants should be avoided.

WARFARIN - POLICOSANOL *2*

Related Drugs

Alteplase	**Anisindione**	**Ardeparin**	**Dalteparin**
Danaparoid	**Dicumarol**	**Enoxaparin**	**Heparin**
Lepirudin	**Reteplase**	**Streptokinase**	**Urokinase**

Other potentially implicated Supplements:

White willow	**Saw palmetto**

Policosanol has antiplatelet actions that might potentiate the anticoagulant effect of warfarin. White willow, a natural source of salicylates, might cause similar effects. Saw palmetto has been implicated in a case of intraoperative hemorrhage associated with increased bleeding times.

Policosanol, used for hyperlipidemia, exhibits dose dependent antiplatelet actions. This effect is comparable to hat of aspirin and combined treatment produces an additive effect.

WARFARIN - VINPOCETINE *3*

Related Drugs

Abciximab	**Alteplase**	**Anagrelide**	**Anisindione**
Ardeparin	**Aspirin**	**Cilostazol**	**Clopidogrel**
Dalteparin	**Danaparoid**	**Dicumarol**	**Dipyridamole**
Enoxaparin	**Eptifibatide**	**Heparin**	**Lepirudin**
NSAID's	**Pentoxifylline**	**Reteplase**	**Streptokinase**
Ticlodipine	**Tirofiban**	**Urokinase**	

Vinpocetine might slightly impair the therapeutic effects of warfarin. Vinpocetine is a dietary supplement promoted for the treatment of age related memory loss and impaired mental function. As a precaution, consider monitoring coagulation parameters more frequently in patients taking vinpocetin with warfarin and adjust the warfarin dose if needed.

WARFARIN - VITAMIN A *3*

Related Drugs:

Anisindione	**Dicumarol**

Other potentially implicated supplements

Vitamin D

Vitamin A reportedly might increase the anticoagulant effects of warfarin, but there is little corroborating evidence.

WARFARIN - VITAMIN C *3*

Related Drugs:

Anisindione Dicumarol

Case reports suggest high dose vitamin C (ascorbic acid) supplements might reduce warfarin's anticoagulant effects. Considering monitoring coagulation parameters frequently.

WARFARIN - VITAMIN E *2*

Related Drugs

Alteplase	**Anisindione**	**Ardeparin**	**Dalteparin**
Danaparoid	**Dicumarol**	**Enoxaparin**	**Heparin**
Lepirudin	**Reteplase**	**Streptokinase**	**Urokinase**

Though a case report and unpublished study suggests that Vit. E may potentiate warfarin's anticoagulant effect, a controlled study found no such interaction. Case report suggests that the time period of concurrent use might be a factor.

despite little evidence and because of its potential consequences, it may be advisable to retest coagulation parameters at selected intervals during the first 6 weeks after initiating Vit. E supplementation in patients stabilized on warfarin.

WARFARIN - VITAMIN K *1*

Related Drugs

Anisindione Dicumarol

Vit. K or changes in foods high in Vit. K can alter the effect of therapy with oral anticoagulants such as warfarin. Avoid foods high in Vit. K to avoid potential life threatening complications.

ZIDOVUDINE - L CARNITINE *3*

Preliminary evidence suggests that the amino acid L carnitine may diminish the mitochondrial toxicity associated with zidovudine and other nucleoside analogs, exert independent positive effects on HIV infection parameters and complement traditional chemotherapeutic regimes in HIV infected patients.

AZT therapy causes a mitochondrial myopathy, characterized by depletion of mitochondrial DNA and other destructive changes that has been associated with a reduction of muscle carnitine levels. Based on the observation that L carnitine plays a major role in long chain fatty acid transport and facilitates the beta-oxidation of fatty acids, it has been proposed as a treatment for these AZT side effects.

ZINC - AMILORIDE *3*

Related Drugs

Spironolactone Triamterene

The potassium sparing diuretic amiloride might significantly reduce zinc excretion which could lead to zinc accumulation and possible toxicity. In contrast, triamterene, another potassium sparing diuretic appears to increase urinary zinc excretion.

During treatment with amiloride, consider monitoring serum zinc levels and watch for signs of zinc toxicity such as flu-like and central nervous system symptoms. High Zinc levels also could lead to copper deficiency with symptoms that include anemia and impaired immunity.

Because marginal zinc deficiency is relatively common, zinc supplementation at standard nutritional levels may be advisable during long term triamteren use. Early symptoms of zinc deficiency include hypogeusia, hyposmia, sexual impotence, and delayed healing.

ZINC - CALCIUM CARBONATE *3*

Calcium containing antacids or calcium supplements might substantially decrease zinc absorption when taken with zinc supplements. However, eating a meal appears to mitigate this effect.

To minimize any potential problems, administer calcium containing antacids or calcium supplements 2-3 hours apart from zinc supplements.

ZINC - CAPTOPRIL *3*
Related Drugs

Benazepril	**Enalapril**	**Fosinopril**	**Lisinopril**
Quinapril	**Ramipril**		

Zinc binds directly to structural groups on the ACE inhibitors captopril and enalapril, leading to a gradual depletion of tissue zinc and possible zinc deficiency. Recommend taking zinc with ACE inhibitors.

ZINC - HYDROCHLOROTHIAZIDE *3*
Related Drugs

Bendroflumethiazide	**Benzthiazide**	**Chlorothiazide**	**Chlorthalidone**
Hydroflumethiazide	**Indapamide**	**Methyclothiazide**	**Metolazone**
Polythiazide	**Quinethazone**	**Trichlormethiazide**	

Long term use of thiazide diuretics may cause zinc depletion by increasing its urinary excretion. Clinically significant effects of this interaction are most likely in individuals with pre-existing impaired zinc status.
Supplement with zinc if long term use.

ZINC - ORAL CONTRACEPTIVES *3*
Oral contraceptives may reduce plasma zinc levels. There is disagreement, but most studies have found that OC's (at least the high estrogen type used at the time the studies were done, may reduce plasma zinc levels. Because marginal zinc deficiency is relatively common, supplementation at standard nutritional levels might be advisable for individual taking OCs.

ZINC - ZIDOVUDINE *2*
Other Potentially Implicated Supplements

Copper	**Vit.B12**

Zidovudine therapy may deplete zinc and copper whether AZT might deplete vit. B12, needs further clarification.

ZOLPIDEM - 5 HTP *2*
Other potentially implicated supplements

L Tryptophan	**St. John's wort**

Several case reports suggest that the risk of zolpidem-induced visual hallucinations may be increased when the drug is combined with agents that enhance serotonin activity.
5 HTP and L tryptophan are both serotonin precursors and St. John's Wort is thought to raise serotonin levels. Based on the case reports, patients taking zolpidem should be advised to avoid these supplements.

DICTIONARY:

ACE inhibitors (Angiotensin-Converting Enzyme) -
a group of pharmaceuticals used primarily in treatment of hypertension and congestive heart failure, left ventricular dysfunction, and prevention of nephropathy in diabetes mellitus. ACE inhibitors are often combined with diuretics for hypertension (usually a thiazide) if the ACE inhibitor is insufficient. In chronic heart failure (usually furosemide) for better symptomatic control.
Renal impairment is a significant adverse effect of all ACE inhibitors and renal blood flow. ACE inhibitors may cause hyperkalemia, angioedema, rash and taste disturbances, hypotension, cough, headaches, dizziness, fatigue nausea.

Beta Blockers:
A class of drugs used for cardiac arrhythmias and cardio protection after myocardial infarction. Beta blockers block the action of endogenous catecholamines (epinephrine(adrenaline) and norepinephrine(noradrenaline) in particular on bad renergic receptors, part of the sympathetic nervous system which mediates the 'fight or flight' response. Works on smooth muscle relaxation - lungs, heart, gastro, liver, uterus, vascular smooth muscle and skeletal muscle. Beta blockers inhibit normal ephinephrine mediated sympathetic actions, but have minimal effect on resting subjects so they reduce the effect of excitement and physical exertion on heart rate and force of contraction, dilation of blood vessels and opening of bronchi, also reduce tremor and breakdown of glycogen.
There is evidence that beta blockers, esp. used with thiazide type diuretics have a risk of provoking type 2 diabetes. Propranolol was the first beta adrenergic receptor antagonist used for angina pectoris.

Calcium channel blockers:
They inhibit the normal movement of extracellular calcium ions across the cell membrane and into myocardial cells and vascular and GI smooth muscle. This calcium blocking effect decreases mechanical contraction of the heart and smooth muscle and results in improved blood flow and oxygen to he heart, dilation of peripheral arteries and decreased total peripheral resistance, blood pressure, and afterload.

Corticosteroids:
A class of steroid hormones that are produced in the adrenal cortex. They are involved in a wide range of physiologic systems such as stress response, immune response and regulation of inflammation, carbo metabolism, protein catabolism, blood electrolyte levels and behavior. Glucocorticoids such as cortisol, control carbohydrate, fat and protein metabolism and are anti-inflammatory by preventing phospholipid release, decreasing eosinophil action and a number of other mechanisms.

Mineralocorticoids such as Aldosterone control electrolyte and water levels, mainly by promoting sodium retention in the kidney.

Corticosteroids are synthesized from cholesterol within the adrenal cortex. Most steroidogenic reactions are catalyzed by enzymes of the cytochrome P450 family. They are located within the mitochondria and require adrenodoxin as a cofactor (except 21-hydroxylase and 17a-hydroxylase).

Synthetic drugs with corticosteroid like effect are used for variety of conditions from brain tumors to skin diseases. Dexamethasone and its derivatives are almost pure glucocorticoids, while Prednisone and its derivatives have some mineralocorticoid action in addition to the glucocorticoid effect.

Fludrocortisone is a synthetic mineralocorticoid.

Hydrocortisone(cortisol) is used for adrenal insufficiency and congenital adrenal hyperplasia.

Synthetic glucocorticoids are used for joint pain/inflam., dermatitis, allergic reactions, asthma, hepatitis, lupus, colitis and crohn's, sarcoidosis, and for glucocorticoid replacement in Addison's disease or other forms of adrenal insufficiency.

Glucortoicoids have effect of drug induced Cushing's syndrome. Mineralcorticoid effect is high blood pressure (hypertension), hypokalemia (low blood potassium levels in the blood), hypernatremia (high sodium levels in the blood) without causing peripheral edema, metabolic alkalosis and connective tissue weakness.

Corticosteriods can cause permanent eye damage by inducing central serous retinopahy. A variety of steroid medications from anti-allergy nasal sprays (naxonex, Flonase) to topical skin creams, to eye drops (Tobradex), to Prednisone have been implicated in the development of Central Serous Retinopathy.

Licorice may increase adverse effects of corticosteroids such as prednisolone. Don't take at same time. Licorice enhances some actions of corticosteroids.

Homocysteine is a toxic amino acid by-products, associated with atherosclerosis.

Hypernatremia: high sodium levels in the blood.

Hypokalemia - Low blood potassium levels in the blood. Symptoms: Anorexia, nausea, vomiting, diarrhea, weakness, visual disturbances (blurred vision), ventricular tachycardia, ventricular contractions.

Ipriflavone - relatively new supplement with varying biological activities that make it seem like an attractive supplement for body builders. Works by inhibiting a calcium dependent protease throughout the body. Has been shown to be totally safe, no side effects.

Potassium-depleting: loss of potassium in urine
Potassium-sparing: retention of potassium in urine

VIVO - takes place inside an living organism
VITRO - experiment in a test tube.