

## Northwestern Memorial Hospital

### DIETARY SUPPLEMENTS, HERBS, NUTRACEUTICALS:

#### Interactions of Drugs, Dietary Agents & Herbs

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Patients are increasingly using alternative treatments and generally consider them to be natural and safe. However, adverse effects and significant interactions with prescription medications have been reported in the literature. Therefore, when taking a patient's diet and medication history, be sure to ask about use of herbs, nutraceuticals, dietary supplements, megavitamins, or other types of alternative treatments.

The following is some basic information about some commonly used products. However, because dosage regimens for treatment claims can vary considerably, these are not included here. **If there is a question about the dose history given by a patient or if there are other questions about these products, we suggest calling the Drug Information Center (6-7574) or consulting a resource such as Clinical Pharmacology Online (<http://cpip.gsm.com>) from a hospital computer terminal.** Tables after the basic information list harmful substances and links to some useful Internet resources.

It is important to recognize that there is little regulation and standardization of these products. (Tyler, 2000; Murch, 2000) They are made by multiple manufacturers in a variety of preparations and strengths. Unlike prescription drugs, these products do not undergo Food and Drug Administration pre-market review and approval based on evidence of safety and efficacy. In addition, there are no requirements for post-marketing reporting of adverse events. The AMA has adopted the position that alternative treatments should meet USP (U. S. Pharmacopeia) compendial standards of identity, strength, quality, purity, packaging, and labeling. The USP is compiling official monographs, but only select ones are freely available through its Internet website.

*There is no endorsement for the use of any of these products. They are not available from the Department of Pharmacy or from Food & Nutrition Services. Please refer to Patient Care Policy 5.34 concerning inpatient use of these products.*

#### **Astragalus (*A.membranaceus*, *A.mongholicus* or *Huang Chi'I*)**

**CLAIMED BENEFITS** Treatment of ischemic heart disease, MI, CHF, relief of anginal pain; adjunct to cancer therapy due to immune effects

**LITERATURE FINDINGS** Animal studies support cardiogenic and immunomodulator claims, but the only human data are from case series and weak trials. (Kemper, 1999)

**MECHANISM OF ACTION** In vitro antioxidant activity.

**REACTIONS / WARNINGS** Should not be taken if high fever or severe inflammation. Should not be used for longer than 3 weeks without close monitoring.

**DRUG INTERACTIONS** May potentiate antihypertensive, anticoagulant, and antidiabetic drugs

#### **Bilberry (*Vaccinium corymbosum* or *V.myrtillus*)**

**CLAIMED BENEFITS** Claimed to benefit visual acuity, protect against glaucoma, cataracts, macular degeneration; also, for relief of diarrhea.

**LITERATURE FINDINGS** No reported randomized clinical trials evaluating effects and safety

**MECHANISM OF ACTION** Antioxidant, vasoprotective, possible inhibition of platelet aggregation.

**REACTIONS / WARNINGS** Physician should be consulted if diarrhea persists after 3 days of use.

**DRUG INTERACTIONS** None known

#### **Black Cohosh (*Cimicifuga racemosa*)**

**CLAIMED BENEFITS** Treatment of dysmenorrhea; menopausal symptoms; partus preparator during last month of pregnancy; vascular smooth muscle relaxant.

**LITERATURE FINDINGS** Placebo-controlled studies found therapeutic efficacy in menopausal women, although the studies were not double-blinded. (Daiber, 1983; Duker, 1991; Schulz, 1998; Vorberg, 1984; Warnecke, 1985) In a randomized, placebo-controlled trial of black cohosh in breast cancer patients, black cohosh was not significantly more efficacious than placebo against most menopausal symptoms, including number and intensity of hot flashes. (Jacobson, 2001)

**MECHANISM OF ACTION** Lowers leuteinizing hormone by binding pituitary estrogen receptors. Also binds to peripheral estrogen receptors

**REACTIONS / WARNINGS** Hypotension, stomach upset, weight gain, dizziness are rare. Fetotoxic – avoid during first trimester of pregnancy

**DRUG INTERACTIONS** May potentiate antihypertensives; may interfere with oral contraceptives or estrogen.

### ***Cat's Claw (*Uncaria tomentosa*)***

**CLAIMED BENEFITS** Anti-inflammatory, anticancer, and contraceptive (abortifacient) claims

**LITERATURE FINDINGS** Historical and case report series suggest some beneficial effects on HIV and cancer, but there are no reported randomized clinical trials evaluating effects of cat's claw in humans. (Kemper, 1999)

**MECHANISM OF ACTION** Plant's pentacyclic oxindole alkaloids have immunostimulant properties.

**REACTIONS / WARNINGS** Mild nausea, transient diarrhea. Avoid in pregnancy, lactation, in transplants, hemophiliacs, patients receiving vaccines, sera, IG, insulin, or thymus extracts.

**DRUG INTERACTIONS** None known.

### **Chondroitin**

**CLAIMED BENEFITS** Antiarthritic, cartilage matrix enhancer claimed to help prevent the breakdown and to promote rebuilding of cartilage.

**LITERATURE FINDINGS** Meta-analysis of published and unpublished double-blind, randomized, placebo-controlled trials for knee or hip OA found some degree of efficacy (measured by WOMAC scale and the Lequesne Index), but also found issues with the quality of the trials. (McAlindon, 2000) An NIH-sponsored study started enrolling participants in late 2000 to find whether chondroitin or glucosamine are more effective than placebo for treating knee pain associated with OA. (NCCAM, 2000)

**MECHANISM OF ACTION** Possible inhibition of cartilage-degrading enzymes.

**REACTIONS / WARNINGS** Abdominal pain, alopecia, anorexia, constipation, diarrhea, drowsiness, insomnia, headache Caution with driving, operating machinery, or performing tasks that require mental alertness. Should be used with caution in persons with GI disease.

**DRUG INTERACTIONS** None known

### **Chromium Picolinate**

**CLAIMED BENEFITS** Claimed to help maintain normal metabolism of glucose, cholesterol and fat.

**LITERATURE FINDINGS** Two unpublished research studies by USDA showed increase in muscle mass and decrease in body fat. Other numerous trials were not supportive. In November 1996 the FTC ordered companies stop to all unsubstantial claims. (Coleman, 1997)

**MECHANISM OF ACTION** Biochemical, physiological, and behavioral actions may be a consequence of the effects of picolinic acid on the CNS

**REACTIONS / WARNINGS** May cause serious renal impairment and rhabdomyolysis when ingested in excess (>400 mcg/day); irregular heart beat, alopecia, rash, flushing. ADA does not recommend use for diabetics.

**DRUG INTERACTIONS** None known.

### ***DHEA (Dehydroepiandrosterone)***

**CLAIMED BENEFITS** Claimed to enhance performance, prevent heart disease, reverse aging, immunostimulation, treat osteoporosis, SLE, depression, erectile dysfunction.

**LITERATURE FINDINGS** Objective, well controlled, large-scale, studies are lacking

**MECHANISM OF ACTION** DHEA is the most prevalent androgen produced by the adrenal glands.

**REACTIONS / WARNINGS** Prostate enlargement, hepatotoxicity, risk for ovarian/prostate cancer .

Signs of excess testosterone possible in males and females

**DRUG INTERACTIONS** Additive / antagonistic effects with androgens, estrogens, oral contraceptives, or progestins. Actions of finasteride and saw palmetto could be potentially antagonized.

### ***Echinacea (E.angustifolia, E.purpurea or E.pallida)***

**CLAIMED BENEFITS** Treatment of general infectious conditions from virus, bacteria, and Candida species; influenza, colds, upper respiratory tract infections, and urogenital infections

**LITERATURE FINDINGS** Randomized controlled clinical trials done in Germany showed beneficial effects treatment and prophylaxis of URI. A US study did not find any improvements over placebo for URI prophylaxis, although the study did not use German Commission E approved products. (Melchart, 1998)

**MECHANISM OF ACTION** Immunostimulant of macrophages and T-cells.

**REACTIONS / WARNINGS** Tingling sensation on tongue; fever from freshly pressed juice; cross-sensitivity in patients allergic to sunflower seeds and flowers (pollen) in the daisy family. Caution in transplants, RA, lupus, AIDS, or leukemias. Recurrent erythema nodosum has been reported. (Soon, 2001)

**DRUG INTERACTIONS** Should not be administered with immunosuppressants.

### ***Ephedra (Ma-Huang, Chinese ephedra, Ephedra sinica)***

**CLAIMED BENEFITS** Promoted as a natural remedy to help control weight. Also touted for asthma, and as a nasal decongestant.

**LITERATURE FINDINGS** Ephedrine with caffeine was studied in a randomized double-blind placebo-controlled study with a 1-year follow-up in 225 subjects. Weight gain was significantly lower in the ephedrine plus caffeine-treated group during the first 12 weeks, but weight gains were similar after 1 year. (Norregaard 1996)

**MECHANISM OF ACTION** Contains ephedrine which releases epinephrine. This causes an increase in cAMP and relaxes smooth muscle. (Robbers, 1999) Similar to other alkaloids such as pseudophedrine.

**REACTIONS / WARNINGS** The FDA issued a warning based on 800 reports of adverse events associated with the use of ephedrine products which included episodes of high blood pressure, irregularities in heart rate, insomnia, nervousness, tremors, headaches, seizures, heart attacks, strokes and death. Most occurred in young to middle aged, otherwise healthy adults using the products for weight control and increased energy.(HHS, 1997) An additional review of the FDA's Adverse Reaction Monitoring System database found 926 reported cases of possible toxicity from 1995 to 1997. Use was temporally related to stroke in 16, myocardial infarction in 10, or sudden death in 11. In 36 of these 37 patients, use was reported to have been within the manufacturers' dosing guidelines. (Samenuk, 2002) Analysis of ephedra containing products showed alkaloid content varied considerably from the labeled content. (Gurley, 2000)

**DRUG INTERACTIONS** Avoid use in patients treated for hypertension or cardiac problems.

### ***Garlic (Allium sativum)***

**CLAIMED BENEFITS** Promoted for lowering blood pressure and cholesterol. Also, as an anti-microbial and preventative agent for cancer.

**LITERATURE FINDINGS** A double-blind crossover trial with garlic supplements showed a 6% decrease in cholesterol and 5.5% decrease in systolic blood pressure. (Steiner, 1996) A meta-analysis found a slight decrease in colorectal and stomach cancer among patients consuming garlic, but the heterogeneity of the studies makes results

questionable. (Fleischauer 2000 ) A randomized, double-blind, placebo-controlled study found no significant lipid changes in garlic-treated groups. (Issacsohn 1998) A meta-analysis of randomized, double blind, placebo-controlled trials suggests that garlic is superior to placebo in reducing total cholesterol levels. However, the size of effect was modest. (JAMA 1998) A very recent AHRQ review of research evidence found insufficient data to draw conclusions regarding garlic's effects on claudication, myocardial infarction, and its antithrombotic activity. Garlic preparations showed small, positive, short-term (< 3 months) effects on lipids. No effects on glucose or insulin sensitivity were found. Blood pressure reduction was not consistently found. Using "any" garlic supplement for less than 3 to 5 years was not associated with decreased risks of breast, lung, gastric, colon, or rectal cancer.(AHRQ, 2000)

**MECHANISM OF ACTION** The active compound allicin is broken down and metabolized into vinylthiine which; enhances the synthesis of nitric oxide and has antihypertensive and antimicrobial properties; also high in selenium which is thought to possibly account for any cancer preventative effects.

**REACTIONS/WARNINGS** Halitosis, heartburn, nausea, vomiting, flatulence, bloating, flushing, headache, orthostatic hypotension, sweating, offensive body odor.

**DRUG INTERACTIONS** May potentiate effects of anticoagulants. Changes pharmacokinetic variables of acetaminophen and produces hypoglycemia when taken with chlorpropamide. (Izzo, 2001)

### **Ginkgo Biloba (*Ginkgo Biloba*)**

**CLAIMED BENEFITS** Claimed to help vascular insufficiency resulting in short-term memory loss, vertigo, headache, tinnitus, depression, intermittent claudication, early Alzheimer's disease, senility, diabetic retinopathy, wheezing.

**LITERATURE FINDINGS** Meta-analysis of 8 placebo-controlled trials showed ginkgo more effective than placebo for a variety of complaints, including memory and concentration problems, headaches, depression, and dizziness. (Kleijnen, 1992) A meta analysis of randomized placebo controlled double blind trials of ginkgo for intermittent claudication showed ginkgo to be superior to placebo for treatment. (Pittler, 2000)

**MECHANISM OF ACTION** Ginkgo flavone glycosides inhibit platelet aggregation, scavenge free radicals, inhibit histamine and leukotriene production.

**REACTIONS / WARNINGS** GI discomfort, headache, dizziness, palpitations Blood pressure and heart rate changes during surgery. Should be stopped 2-3 weeks before surgery. (Anesthesiologists 1999)

**DRUG INTERACTIONS** Monitor bleeding times in patients on antiplatelet drugs and warfarin. Increased blood pressure has resulted when combined with a thiazide diuretic, and coma has been reported when combined with trazodone. (Izzo, 2001)

### **Ginseng (*Panax ginseng*)**

**CLAIMED BENEFITS** Claimed to relieve fatigue, stress, and menopausal symptoms, to treat impotence and infertility; and to enhance the immune system.

**LITERATURE FINDINGS** No effect on exercise capacity, heart rate, or workload found in double-blind trial.(Allen, 1998) Other multiple clinical trials showed improvement in mood (in 13 trials), physical performance (in 17 trials) and intellectual performance (in 11 trials). (Hall, 1999) A double blind, randomized, placebo controlled trial of 227 patients evaluated immune enhancing properties after influenza vaccine: 42 cases of influenza or common cold were reported in the placebo group vs. 15 with ginseng. (p<0.001). (Scaglione, 1996)

**MECHANISM OF ACTION** Regulation of catecholamine secretion, antiplatelet effects, and enhanced nitric oxide synthesis are postulated. (Janetzky, 1997)

**REACTIONS / WARNINGS** Nervousness, depression, hypertension, insomnia, eruptive dermatitis (25%), fever, bleeding, mammary nodules, tachycardia if > 3 g/day. Decreased blood glucose in diabetics and nondiabetics. (Vuksan, 2000) Blood pressure and heart rate changes during surgery. (Janetzky, 1997) Should be stopped 2-3 weeks before surgery. (Anesthesiologists 1999)

**DRUG INTERACTIONS** Monitor patients taking anticoagulants (CPOnline) May interfere with digoxin activity or monitoring. Can lower blood concentrations of warfarin and has induced mania when used concomitantly with phenelzine. (Izzo, 2001)

## Glucosamine Sulfate

**CLAIMED BENEFITS** Claimed to relieve joint pain and tenderness, improve range of motion and walking speed in osteoarthritis

**LITERATURE FINDINGS** Meta-analysis of published and unpublished double-blind, randomized, placebo-controlled trials for knee or hip OA found some degree of efficacy (measured by WOMAC scale and the Lequesne Index), but also found issues with the quality of the trials. (McAlindon, 2000) An NIH-sponsored study started enrolling participants in late 2000 to find whether glucosamine or chondroitin are more effective than placebo for treating knee pain associated with OA. (NCCAM, 2000) A 3 year randomized, double-blind of glucosamine sulphate or placebo for knee osteoarthritis assessed long-term progression of joint structure changes and symptoms. There was significant joint-space loss seen with placebo, but not glucosamine. As assessed by WOMAC scores, symptoms worsened slightly with placebo compared with some improvement after glucosamine. (Reginster, 2001)

**MECHANISM OF ACTION** In vitro simulator of production of glycosaminoglycan promoting the rebuilding of damaged cartilage.

**REACTIONS / WARNINGS** Mild gastrointestinal problems, drowsiness, skin reactions, and headache. Possible insulin resistance in nondiabetic subjects. (Almada, 2000)

**DRUG INTERACTIONS** None known

## Kava (*Piper methysticum*)

**CLAIMED BENEFITS** Claimed to be useful for anxiety disorders, stress, insomnia, menopausal symptoms and restlessness.

**LITERATURE FINDINGS** A systematic review and meta-analysis found kava extract superior to placebo as a symptomatic treatment of anxiety. (Pittler 2000)

**MECHANISM OF ACTION** Thought to act on GABA receptors to produce anxiolytic and mild sedative activity. May also alter CNS serotonin (5-HT) activity at 5-HT type 1A receptors and inhibit dopamine or norepinephrine.

**REACTIONS / WARNINGS** Gastrointestinal discomfort, headache, dizziness and hair loss, kava dermopathy (yellow discoloration of the skin, hair and nails). Can cause drowsiness and may impair motor reflexes. Long-term use of large amounts of kava is associated with significant weight loss, reduced protein levels, puffy faces, scaly rashes, hematuria, increased red blood cell volume, decreased platelets and lymphocytes, and possibly pulmonary hypertension. **\*The FDA has issued a warning about risk of severe liver injury (hepatitis, cirrhosis, and liver failure) associated with the use of kava-containing dietary supplements. Persons who have liver disease or persons taking drug products that can affect the liver, may be at increased risk from using kava-containing supplements. The FDA has urged reporting of any cases of liver problems and other injuries that may be related to the use of kava.** (USFDA, 2002)

**DRUG INTERACTIONS** Should avoid concurrent use with anxiolytics, sedatives, and hypnotics. Substances that act on the CNS, including barbiturates and psychopharmacologic agents, may increase the effects of kava and increase adverse events. Ethanol intoxication may increase kava toxicity. Those taking anticonvulsants, skeletal muscle relaxants, tricyclic antidepressants, MAOIs, lithium, and SSRIs should avoid the use of kava. In addition, persons taking warfarin or other anticoagulants should not use kava. Kava may antagonize levodopa therapy and has been reported to increase the symptoms of Parkinson's and can cause a semicomatose state when given concomitantly with alprazolam. (Izzo, 2001)

## Milk thistle (*Silybum marianum*)

**CLAIMED BENEFITS** Claimed to benefit a wide range of liver problems.

**LITERATURE FINDINGS** Protective against hepatotoxins in small animal studies. Effective against liver damage from the death cup mushroom *Amanita phalloides* within 24 hours after ingestion. (Robbers, 1999) Encouraging small human trials for hepatitis and cirrhosis of various origins. (Tyler, 1993)

**MECHANISM OF ACTION** Active principles: silymarin and silybin appear to be: antioxidants and to stimulate protein synthesis in hepatocytes. (Robbers, 1999)

**REACTIONS / WARNINGS** Severe gastroenteritis, thrombocytopenia  
**DRUG INTERACTIONS** None known

### **SAMe (*S-adenosyl-methionine*)**

**CLAIMED BENEFITS** Claimed to improve joint mobility and comfort by restoration of damaged cartilage associated with osteoarthritis. Also claimed to help depression

**LITERATURE FINDINGS** Randomized, double-blind trials in osteoarthritis found efficacy was similar to several NSAIDs: ibuprofen (Muller-Fassbender, 1987), indomethacin (Vetter, 1987), piroxicam (Maccagno, 1987) and naproxen (Caruso, 1987). Meta-analysis of multiple clinical studies showed SAMe better than placebo, but comparable to TCAs in treatment of depression. (Bressa, 1994)

**MECHANISM OF ACTION** Increases levels of serotonin, dopamine, and phosphatidylserine.

**REACTIONS / WARNINGS** Nausea, restlessness, anxiety, induction of mania, and hypomania.

May precipitate mania in bipolar patients

**DRUG INTERACTIONS** Risk of serotonin syndrome if used with serotonergic drugs. Do not combine with antidepressants.

### **Saw Palmetto (*Serenoa repens*)**

**CLAIMED BENEFITS** Promoted for relief of symptoms of benign prostatic hyperplasia (BPH).

**LITERATURE FINDINGS** Evidence from studies in men with symptomatic BPH suggests that *S repens* improves urologic symptoms compared to placebo and provides response similar to finasteride. However, this systematic review of studies found limited efficacy due to short study duration and variability in study design, the preparations, and reporting of outcomes.

There is a need for research using standardized preparations to determine long-term safety, effectiveness and ability to prevent BPH complications. (Wilt, 1998)

**MECHANISM OF ACTION** Antiandrogenic alpha1 adrenergic blocking activity. (Marks, 1998; CP Online)

**REACTIONS / WARNINGS** Headache, dizziness, gastrointestinal problems. (Blumenthal, 1998)

**DRUG INTERACTIONS** Avoid concurrent use in patients on finasteride.

### **Soy**

**CLAIMED BENEFITS** Claimed to lower blood cholesterol levels, decrease osteoclast activity in osteoporosis, provide renal-protection, decrease menopausal symptoms (hot flashes).

**LITERATURE FINDINGS** Meta-analysis of controlled studies supports phytoestrogen role in decreasing menopausal symptoms and for possible protective effects on bones and the cardiovascular system. (Seidl, 1998) Double-blind, parallel, placebo-controlled trial found improved menopausal symptoms. (Albertazzi, 1999) A synthetic version of a soy isoflavone, ipriflavone, did not prevent postmenopausal bone loss and caused lymphocytopenia in 13%. (Alexandersen, 2001) A randomized, double-blind trial for treatment of hot flashes in breast cancer survivors found no difference between placebo and the soy supplement. (Quella, 2000)

**MECHANISM OF ACTION** Contains phytoestrogens, isoflavones

**REACTIONS / WARNINGS** Stomach pain, loose stool, diarrhea

**DRUG INTERACTIONS** None known

## **St. John's Wort (*Hypericum Perforatum*)**

**CLAIMED BENEFITS** Mild-to-moderate depression; anxiety.

**LITERATURE FINDINGS** Meta analysis of 23 randomized controlled trials found that St. John's wort (SJW) was more effective than placebo, and comparable to standard antidepressants (TCAs). (Linde, 1996) However, TCAs were dosed in daily amounts below or at the lower end of the usual dose range. A randomized, double blind comparison of SJW extract with imipramine in mild to moderate depression found similar efficacy, but better tolerability for the extract. (Woelk, 2000) A randomized, double-blind, placebo-controlled trial in 200 patients with major depression found no difference in depression outcome measures between SJW and placebo. Although the rate of remission was higher for those on SJW than in those on placebo, remission rates for both groups were very low. (Shelton, 2001) In a randomized, double-blind, placebo-controlled trial in 340 patients with moderately severe major depression, neither *H. perforatum* nor sertraline was significantly different from placebo in the 2 primary outcome measures, although sertraline was better than placebo in a secondary measure - CGI improvement. (HDTSG, 2002) Quality testing of 21 brands of SJW found that one-third either had inadequate active ingredients or contained excessive amounts of cadmium. (ConsumerLab, 2001)

**MECHANISM OF ACTION** Possible inhibition of MAO and COMT; may raise levels of serotonin; lower levels of the stress hormone cortisol or affect GABA receptors in the brain.

**REACTIONS / WARNINGS** Photosensitivity, GI upset, hypertension, serotonin syndrome. Hair loss and serotonin syndrome have been reported. (Parker, 2001) Reports of mania, hypomania. Should be stopped 2-3 weeks before surgery. (Anesthesiologists1999)

**DRUG INTERACTIONS** Induces CYP450 1A2, 3A4 enzymes; there is also evidence that it increases P-glycoprotein expression. (Hennessy, 2002). May decrease levels of indinavir (Piscitelli, 2000) and possibly other protease inhibitors, cyclosporin, theophylline, warfarin, oral contraceptives, and midazolam. (Dresser, 2001) Kidney and heart transplant rejections have been associated with use in patients on cyclosporin. (Barone, 2000; Ruschitzka 2000) SJW can lower blood concentrations of amitriptyline and digoxin. (Izzo, 2001) Also SJW can cause intermenstrual bleeding when used concomitantly with oral contraceptives. (Izzo, 2001) Avoid SJW use with ephedrine, MAOIs, SSRIs, antidepressants, and serotonergic drugs. Delirium has been reported with loperamide and mild serotonin syndrome with SSRIs. (Izzo, 2001) Plasma levels of the active metabolite of irinotecan were dramatically lowered in a study of colorectal cancer patients who took SJW. (Mathijssen, 2002) The FDA has advised health care professionals about the risk of drug interactions with St. John's wort. (Henney, 2000)

## **Valerian (*Valerian officinalis*, *V. wallichii*, *V. alliariifolia*, or *V. sambucifolia*)**

**CLAIMED BENEFITS** Claimed to help treat insomnia, agitation, tension and anxiety. Controlled studies in humans show efficacy and safety for mild insomnia.

**LITERATURE FINDINGS** A double-blind, randomized, placebo controlled study in 27 patients with mild insomnia demonstrated that valerian significantly ( $p < 0.001$ ) improved subjective sleep quality with a lack of side effects. (Lindahl, 1988)

**MECHANISM OF ACTION** Appears to alter neurotransmitter levels including GABA, SE, and NE

**REACTIONS / WARNINGS** CNS depression, headache, paradoxical excitation, uneasiness, cardiac changes, possible hepatotoxicity

**DRUG INTERACTIONS** Should avoid concurrent use with alcohol, sedatives, hypnotics.

## ALTERNATIVE TREATMENTS: DIETARY SUPPLEMENTS, HERBS, NUTRACEUTICALS

### KNOWN HARMFUL SUBSTANCES

Substance	Reported Adverse Outcomes
<i>Aconitum sp.</i>	cardiac arrhythmias
<i>Aristolochia fangchi</i>	renal failure, urinary tract cancer
<i>Chaparral (Larrea tridentata)</i>	hepatotoxicity
<i>Comfrey (Symphytum sp.)</i>	hepatic failure, death
<i>Dong quai (Angelica archangelica)</i>	phototoxicity, bleeding diathesis
<i>Gamma butyrolactone</i>	seizures, respiratory depression, coma, death
<i>Germander (Teucrium chamaedris)</i>	hepatotoxicity, death
<i>Germanium</i>	renal failure, death
<i>Heliotropium sp.</i>	hepatic failure
<i>Jui</i>	thrombocytopenia
<i>Khat (Catha edulis)</i>	hypertension, hyperthermia, stroke, MI, cirrhosis
<i>Kombucha tea</i>	hepatotoxicity, systemic allergic reactions
<i>Koo Sar</i>	lead intoxication
<i>Lobelia (Lobelia inflata)</i>	hepatotoxicity, tachycardia, coma, SLUDGE syndrome
<i>Ma huang (Ephedra sp.)</i>	HTN, seizures, stroke, MI, death
<i>Paraguay tea (Ilex paraguayensis)</i>	hepatotoxicity, esophageal cancer
<i>Pennyroyal (Mentha pulegium)</i>	neurotoxicity, multiorgan failure
<i>Sassafras albidum</i>	hepatocarcinogenicity
<i>Senecia sp.</i>	hepatotoxicity
<i>Sophora flavescens</i>	seizures
<i>Wormwood (Artemisia absinthium)</i>	hallucinations

### USEFUL INTERNET LINKS FOR ADDITIONAL INFORMATION

WebSite	Web Address
Alternative Medicine Internet Resources Directory	<a href="http://www.pitt.edu/~cbw/internet.html">http://www.pitt.edu/~cbw/internet.html</a>
American Society of Anesthesiologists: Anesthesiologists Warn: <i>If You're Taking Herbal Products, Tell Your Doctor Before Surgery</i>	<a href="http://www.asahq.org/PublicEducation/herbal.html">http://www.asahq.org/PublicEducation/herbal.html</a>
Clinical Pharmacology Online 2000	<a href="http://www.gsm.com/">http://www.gsm.com/</a>
Complementary Medicine Collected Resources at British Medical Journal	<a href="http://www.bmj.com/cgi/collection/complementary_medicine">http://www.bmj.com/cgi/collection/complementary_medicine</a>
GAO (Government Accounting Office) Report on Health Products for Seniors. September, 2001 <b>"Anti-Aging" Products Pose Potential for Physical and Economic Harm</b>	<a href="http://www.gao.gov/new.items/d011129.pdf">http://www.gao.gov/new.items/d011129.pdf</a>
Longwood Herbal Task Force at Massachusetts College of Pharmacy and Health Sciences: Survey of Alternative/ Complementary Healing Practices	<a href="http://www.mcp.edu/herbal/default.htm">http://www.mcp.edu/herbal/default.htm</a>
Medline Plus Health Information: Herbal Medicine	<a href="http://www.nlm.nih.gov/medlineplus/herbalmedicine.html">http://www.nlm.nih.gov/medlineplus/herbalmedicine.html</a>
Medem (see <i>Medical Library: Therapies and Health Strategies: Complimentary and Alternative Medicine</i> )	<a href="http://www.medem.com/">http://www.medem.com/</a>
Public Citizen's Health Research Group: March 20,2001 Testimony at House of Representatives Committee on Government Reform Hearing on Dietary Supplements	<a href="http://www.citizen.org/hrg/PUBLICATIONS/1560.htm">http://www.citizen.org/hrg/PUBLICATIONS/1560.htm</a>
National Institute of Health <b>Office of Dietary Supplements</b>	<a href="http://odp.od.nih.gov/ods/">http://odp.od.nih.gov/ods/</a>
National Institutes of Health National Center for Complementary and	<a href="http://nccam.nih.gov/nccam/databases.html">http://nccam.nih.gov/nccam/databases.html</a>

Alternative Medicines <b>Complementary and Alternative Medicine (CAM) Citation Index (CCI)</b>	
Scientific Review of Alternative Medicine	<a href="http://primarycare.medscape.com/Prometheus/SRAM/public/SRAM-journal.html">http://primarycare.medscape.com/Prometheus/SRAM/public/SRAM-journal.html</a>
U. S. Department of Agriculture's Agricultural Research Service The National Agricultural Library: <b>Dietary Supplement and Herbal Information</b>	<a href="http://www.nal.usda.gov/fnic/etext/000015.html">http://www.nal.usda.gov/fnic/etext/000015.html</a>
U. S. Food and Drug Administration Consumer Magazine <b>Supplements Associated with Illnesses and Injuries</b>	<a href="http://www.fda.gov/fdac/features/1998/dietchrt.html">http://www.fda.gov/fdac/features/1998/dietchrt.html</a>
U. S. Food and Drug Administration Center for Food Safety and Applied Nutrition <b>Dietary Supplements</b>	<a href="http://vm.cfsan.fda.gov/~dms/supplmnt.html">http://vm.cfsan.fda.gov/~dms/supplmnt.html</a>
U. S. Food and Drug Administration Center for Food Safety and Applied Nutrition Office of Special Nutritionals <b>The Special Nutritionals Adverse Event Monitoring System</b>	<a href="http://vm.cfsan.fda.gov/~dms/aems.html">http://vm.cfsan.fda.gov/~dms/aems.html</a>
U. S. Pharmacopeia Dietary Supplements	<a href="http://www.usp.org/dietary/index.htm">http://www.usp.org/dietary/index.htm</a>

REFERENCES: The complete references cited may be accessed on the Intranet at:  
<http://intra1-y2k/nmh/docs/OPTIMIZMEDUSE/DIETARYSUPPLEMENTS.DOC>