

Herbs and Anesthesia

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Dedicated to the Indiana University School of Medicine
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PREFACE

The main purpose for writing this small handbook is to have a quick reference guide for common herbal medications popular with the general public. There have been many articles published stating the common drug interactions between medicine and herbs. There are many excellent detailed books in the market on herbs, but I felt there was not a good, quick, high-yield book on herbs and anesthesia.

At this time, there are no randomized, controlled trials that evaluate the effects of prior herbal medicine use on the period immediately before, during, and after surgery. My intention in writing this book is not to persuade anyone against herbal medication, nor is it my intention to have anyone postpone or cancel any type of surgery. My only focus is the safety of the patient and to provide them with the best possible care perioperatively.

As I have mentioned in the Background, use of herbal medications is not necessarily a contraindication for anesthesia. By reading this quick guide, anesthesiologists can be familiarized with the common herbs, their side effects and interactions, and intraoperative complications.

Hopefully, readers will benefit from this book and be informed on herbs and anesthesia.

Abdul N. Naushad, M.D.

HERBS AND ANESTHESIA

Background

Herbs include flowering plants, shrubs, trees, moss, fern, algae, seaweed, or fungus. Recently, an increased number of people have turned to herbal remedies for a number of reasons. In 1997, U.S. adults spent more than \$3.5 billion on herbal products and billions more on vitamins, minerals and other dietary supplements. This number has increased to \$14 billion in the year 2000. One in five individuals who takes prescription medications also takes herbal preparations, high-dose megavitamins, or both. Eisenberg et al., estimate that 15 million people who take herbal medicine may be at risk for potential adverse interactions between their prescription medications and these products. (**JAMA. 1998; 280:1569-1575.**)

Frighteningly, the production and marketing of the majority of alternative medicines is unregulated and the companies are not required to demonstrate safety, efficacy or quality in the same manner as prescription medicines. This is due to the fact that herbal medications were classified as dietary supplements in the Dietary Supplement Health and Education Act of 1994.

Currently, there is an inconsistency in safety guidelines for manufacturing, labeling, promotion of health claims, and potency and purity of compounding. Herbal medications cannot gain patent rights and, as such, they are not termed “drugs.” The FDA can “suggest” but cannot require the herbal industry to provide scientific data to its consumers.

Polypharmacy and physiological alterations that occur during the perioperative period may cause morbidity and mortality associated with herbal medications. Perioperative complications that may occur include increased blood pressure, myocardial infarction, stroke, increased risk of bleeding, prolonged anesthesia, organ transplant rejection, and interference with many medications. (**JAMA. 2001;286:208-216.**)

Use of herbal medications is not necessarily a contraindication for anesthesia.

Pending more definitive studies and in the best interest of patient safety, ASA is taking a leading role in educating the physician as well as the patient about the importance of a thorough history of a patient’s medication use. Patients should tell their physicians and physicians should ask about all herbal, dietary or other over-the-counter preparations as well as prescription medicine that the patient is taking.

CAYENNE (CAPSICUM ANNUUM)

COMMON USES

Help in digestion of food, GI stimulant, for colic, diarrhea, cramps, toothache, **insufficient peripheral circulation, reducing blood cholesterol and clotting tendencies, and for preventing arteriosclerosis and heart disease.**

MECHANISM OF ACTION

Capsicum contains capsaicinoid constituents, which stimulate digestion and help to aid in digestion.

ADVERSE REACTIONS

GI irritation, sweating, and flushing of the head and neck, lacrimation, and rhinorrhea. Excessive amounts of capsicum can lead to gastroenteritis, and hepatic or renal damage. Capsicum may cause **hypocoagulability**. Avoid mixing with ACE inhibitors and theophylline.

POSSIBLE INTERACTION WITH DRUGS

ANTI-HYPERTENSIVE DRUGS: Might interfere by **increasing catecholamine secretion.**

ANTIPLATELET DRUGS: Might increase the effects and adverse effects of **antiplatelet drugs.**

BARBITURATES AND DRUGS WITH SEDATIVE PROPERTIES: Might enhance sedative effects.

COCAINE: Might increase cocaine effects.

MAOI'S: Might interfere with the activity of MAOI's by increasing catecholamine secretion

DOSAGE

30-120 mg three times daily

PERIOPERATIVE CONCERNS

May increase bleeding.

PREOPERATIVE DISCONTINUATION

No data

ECHINACEA

COMMON USES

Used to boost the **immune system** and helps fight colds and flu; aids wound healing.

MECHANISMS OF ACTION

They inhibit tissue and bacterial hyaluronidase, have anti-inflammatory activity, and stimulate the anterior pituitary-adrenal cortex.

ADVERSE REACTIONS

May cause **hepatotoxicity** especially when used with other hepatotoxic drugs, i.e., anabolic steroids or methotrexate. Avoid mixing with anabolic steroids, amiodarone, methotrexate, ketoconazole, and cyclosporin.

POSSIBLE INTERACTION WITH DRUGS OR DISEASES

IMMUNOSUPPRESSIVE DRUGS: May interfere with their therapy because of its immunostimulating activity.

IMMUNE DISORDERS: Contraindicated in individuals with AIDS, HIV infection, or other autoimmune diseases.

DIABETES: Might worsen metabolic control

DOSAGE

6-9 ml daily

PERIOPERATIVE CONCERNS

Allergic reactions; decreased effectiveness of immunosuppressants; potential for immunosuppression with long-term use.

PREOPERATIVE DISCONTINUATION

No Data

EPHEDRA

COMMON USES

Used in many over-the-counter diet aids as an **appetite suppressant**; also for asthma or bronchitis.

MECHANISM OF ACTION

The principle alkaloid constituents are ephedrine and pseudo-ephedrine, which can directly and indirectly stimulate the sympathetic nervous system, increasing systolic and diastolic blood pressure, increase heart rate, causing peripheral vasoconstriction, bronchodilation, and CNS stimulation.

ADVERSE REACTION

Dizziness, motor restlessness, anxiety, irritability, insomnia, headache, anorexia, nausea, vomiting, flushing, tingling, difficulty urinating, **tachycardia, heart palpitations, hyperthermia, drastic increase in blood pressure, heart failure, and death.** Avoid mixing with caffeine, decongestants, stimulants, heart drugs, and antidepressants.

POSSIBLE INTERACTION WITH DRUGS OR DISEASES

CAFFEINE: Increased risk of stimulatory adverse effects of ephedra.

DIGOXIN: Might cause cardiac arrhythmias.

ERGOTAMINE AND OXYTOCIN: Might cause hypertension.

MAOI'S: Contraindicated; concomitant use of ephedra with MAOI's might increase risk of hypertension.

THEOPHYLLINE: Might increase the risk of stimulatory adverse effects.

ANGINA AND HEART DISEASE: Contraindicated due to its cardiac stimulant effects.

HYPERTENSION: Might exacerbate hypertension

PHEOCHROMOCYTOMA: Contraindicated.

ANOREXIA, BULIMIA, CEREBRAL INSUFFICIENCY, HYPERTHYROID, AND THYROTOXICOSIS: Contraindicated

DOSAGE

15-30 mg daily up to a maximum of 300 mg per day

PERIOPERATIVE CONCERNS

Risk of myocardial ischemia and stroke from tachycardia and hypertension; ventricular arrhythmias with halothane; long-term use depletes endogenous catecholamines and may cause intraoperative hemodynamic instability; life-threatening interaction with monoamine oxidase inhibitors.

PREOPERATIVE DISCONTINUATION

At least 24 hours before surgery

FEVERFEW

COMMON USES

Used to prevent **migraine headaches** and for arthritis, rheumatic disease and allergies.

MECHANISM OF ACTION

Feverfew might work in migraine by preventing prostaglandin production.

ADVERSE REACTION

Mouth ulceration; tongue irritation and inflammation, abdominal pain, indigestion, diarrhea, nausea, and vomiting.

POSSIBLE INTERACTIONS WITH DRUGS

ANTICOAGULANT, ANTIPLATELET DRUGS: Feverfew can increase the risk of bleeding by inhibiting platelet aggregation.

DOSAGES

2.5 leaves daily with or after food. The freeze-dried leaf is taken at 50-125 mg per day.

PERIOPERATIVE CONCERN

Can inhibit platelet activity and increase bleeding especially in patients already taking certain anticlotting medications. Avoid mixing with aspirin, ticlid, plavix, persantine, and warfarin.

PREOPERATIVE DISCONTINUATION

No data available

GARLIC

COMMON USES

Garlic is used for **reducing high blood pressure, prevention of coronary heart disease by improving lipid profile, preventing age-related vascular changes and atherosclerosis.**

MECHANISM OF ACTION

Garlic is most commonly used for its antihyperlipidemic, antihypertensive, and antifungal effects. However, it is also reported to have antibacterial, antihelminthic, antiviral, antispasmodic, diaphoretic, expectorant, immunostimulant, and antithrombotic effects.

Garlic has been found to have antithrombotic properties and can **increase fibrinolytic activity, decrease platelet aggregation, and increase prothrombin time.**

ADVERSE REACTIONS

Breath odor, mouth and gastrointestinal burning or irritation, heartburn, flatulence, nausea, vomiting, and diarrhea.

POSSIBLE INTERACTIONS WITH DRUGS OR DISEASES

ANTICOAGULANT/ANTIPLATELET AGENTS: Garlic can enhance the effects of **warfarin (coumadin)** as measured by the **INR**, Garlic might also enhance the effects and adverse effects of aspirin, plavix, ticlid, lovenox, persantine, and others.

BLEEDING DISORDER: **Garlic might increase the risk of bleeding;** contraindicated.

DOSAGES

600-900 mg daily

PERIOPERATIVE CONCERNS

Potential to **increase risk of bleeding**, especially when combined with other medications that inhibit platelet aggregation.

PREOPERATIVE DISCONTINUATION

At least 7 days before surgery.

GINGER

COMMON USES

Ginger is used for reducing nausea, vomiting, and vertigo.

MECHANISM OF ACTION

Ginger inhibits platelets and prostaglandins, and improves appetite and digestion. It also has hypoglycemic, hypotensive or hypertensive, and positive cardiac inotropic activities. Constituents called gingerols demonstrate antipyretic, analgesic, antitussive, cardiogenic, and sedative properties.

ADVERSE REACTIONS

Ginger can cause dermatitis in sensitive individuals. Large overdoses can cause CNS depression and cardiac arrhythmias.

POSSIBLE INTERACTIONS WITH DRUGS OR DISEASES

ANTICOAGULANT/ANTIPLATELET DRUGS: In excessive amounts might increase risk of bleeding.

BARBITURATES: Ginger might enhance barbiturate effects.

BLOOD PRESSURE THERAPY: Due to hypertensive or hypotensive effects, ginger might interfere with blood pressure drug therapy.

CARDIAC DRUGS: Ginger might interfere with cardiac drug therapy due to inotropic effects.

BLEEDING CONDITIONS: Excessive doses can interfere with **increase risk**

of bleeding especially in patients already taking certain anticlotting medications.
Avoid mixing with aspirin, plavix, ticlid, persantine, or warfarin.

DOSAGES

0.25-1 g dried root three times daily or one cup tea three times daily.

PERIOPERATIVE CONCERNS

Potent inhibitor of thromboxane synthetase; **may increase bleeding time and may increase risk of intraoperative hemodynamic instability.**

PREOPERATIVE DISCONTINUATION

At least 7 days before surgery.

GINKGO

COMMON USES

Ginkgo is used for **dementia, for improving blood circulation and oxygenation and for improving memory and mental alertness.**

MECHANISM OF ACTION

Ginkgo is primarily used for cognitive disorders and it seems to affect cognitive deficiency in two ways: it stimulates populations of nerve cells that are still functional, and it protects nerve cells from pathologic influences. It also inhibits platelet-activating factor (**PAF**).

ADVERSE REACTIONS

Bleeding, seizures, headache, dizziness, palpitations, restlessness, nausea, vomiting, diarrhea, lack of muscle tone, weakness, allergic skin reactions, and **bleeding**.

POSSIBLE INTERACTIONS WITH DRUGS OR DISEASES

ANTICOAGULANT, ANTIPLATELET DRUGS: Ginkgo can increase risk of bleeding. Avoid mixing with aspirin, plavix, warfarin, ticlid, and persantine.

MAOIs: Ginkgo might potentiate their activity.

BLEEDING DISORDER: Ginkgo can decrease platelet aggregation by inhibiting platelet-activating factor (**PAF**) and may exacerbate bleeding disorders; use with caution with aspirin, ticlid, plavix, persantine, or warfarin.

DOSAGES

120-240 mg per day.

PERIOPERATIVE CONCERNS

Potential to **increase risk of bleeding**, especially when combined with other medications that inhibit platelet aggregation.

PREOPERATIVE DISCONTINUATION

At least 36 hours before surgery.

GINSENG, PANAX

COMMON USES

Most commonly used as an **antioxidant, for improving physical stamina, cognitive**

function, concentration, and work efficiency.

MECHANISM OF ACTION

The principle constituents of panax ginseng are ginsenosides, which **interfere with platelet aggregation and coagulation.**

ADVERSE REACTIONS

Panax ginseng can cause insomnia, mastalgia, vaginal bleeding, tachycardia, mania, cerebral arteritis, Stevens-Johnson syndrome, cholestatic hepatitis, amenorrhea, decreased appetite, edema, hyperpyrexia, pruritus, rose spots, hypotension, palpitation, headache, vertigo, euphoria, neonatal death, “ginseng abuse syndrome” and **bleeding.**

POSSIBLE INTERACTIONS WITH DRUGS OR DISEASES

ANTICOAGULANT/ANTIPLATELET AGENTS: May decrease effectiveness of warfarin (decreased INR). Avoid mixing with aspirin, warfarin, ticlid, plavix, or persantine.

DIGOXIN: Concomitant use might have synergistic effects in people with CHF.

ANTIDIABETES DRUGS: Concomitant use might enhance blood glucose lowering effects.

MAOIs: Concomitant use with phenelzine is associated with insomnia, headache, tremors, and hypomania.

BLEEDING CONDITIONS: Contraindicated in cases of hemorrhage or thrombosis.

DOSAGES

Cut or powdered root is taken orally 0.6-3 g one to three times per day.

PERIOPERATIVE CONCERNS

Hypoglycemia; potential to **increase risk of bleeding**; potential to decrease anticoagulation effect of warfarin.

PREOPERATIVE DISCONTINUATION

At least 7 days before surgery.

GOLDENSEAL

COMMON USES

Used as a mild laxative and also reduces inflammation.

MECHANISM OF ACTION

The principle constituents are berberine and hydrastine, which has antibacterial and amoebicidal properties.

ADVERSE REACTIONS

Digestive disorders, constipation, excitatory states, hallucinations, and occasionally delirium. Overdose may cause paralysis (amount not known).

POSSIBLE INTERACTIONS WITH DRUGS OR DISEASES

ANTIHYPERTENSIVE DRUGS: Might interfere with blood pressure control due to vasoconstrictive action of constituent hydrastine.

BARBITURATES: Might potentiate barbiturate induced sleep time.

HEPARIN: Might inhibit anticoagulant effects due to the constituent berberine.

SEDATIVE DRUGS: Concomitant use with drugs with sedative properties might cause additive effects and side effects.

CARDIOVASCULAR DISEASE: Theoretically, low doses can increase coronary blood flow and stimulate the heart, while large doses can inhibit cardiac function.

BLEEDING DISORDERS: Use with caution due to berberine, which can inhibit anticoagulant effects

DOSAGES

0.5-1 g three times daily

PERIOPERATIVE CONCERNS

May worsen **edema and/or hypertension**.

PREOPERATIVE DISCONTINUATION

No data.

KAVA

COMMON USES

Kava is used to treat **anxiety disorders**, stress, insomnia, restlessness, and for nervousness. It is used as a **muscle relaxant, and sedative**.

MECHANISM OF ACTION

Kava has been found to have a variety of CNS effects, including anxiolytic, sedative, anticonvulsant, local anesthetic, spasmolytic, and analgesic activities; however, the exact mechanism for these effects is not known.

ADVERSE REACTIONS

Gastrointestinal complaints, headache, dizziness, enlarge pupils and disturbances of oculomotor equilibrium and accommodation. Kava can cause **drowsiness and might impair motor reflexes**.

POSSIBLE INTERACTIONS WITH DRUGS OR DISEASES

CNS DEPRESSANTS: Concomitant use of alcohol, barbiturates, benzodiazepines, or any sedative drugs can increase drug effects, risk of adverse effects and increase sedation.

DEPRESSION: Kava is **contraindicated** in endogenous depression, due to the theoretical sedative activity. Might increase suicide risk.

DOSAGES

100 mg (70 mg kava-lactones) three times daily

PERIOPERATIVE CONCERNS

Potential to **increase sedative effect of anesthetics**.

PREOPERATIVE DISCONTINUATION

At least 24 hours before surgery.

LICORICE

COMMON USES

Used for treating stomach ulcers.

MECHANISM OF ACTION

Licorice has antispasmodic, anti-inflammatory, expectorant, laxative, and soothing properties. The constituents, glycyrrhizin and glycyrrhetic acid, inhibit 11-beta-hydroxysteroid dehydrogenase which may contribute to licorice associated mineralocorticoid side effects including hypertension and hypokalemia.

ADVERSE REACTIONS

The use of licorice can cause amenorrhea. Large amounts can cause hypertension, lethargy, headache, sodium and water retention, edema, and hypokalemia.

POSSIBLE INTERACTIONS WITH DRUGS OR DISEASES

ANTIHYPERTENSIVE DRUGS: Large amounts of licorice can cause sodium and water retention, and hypertension.

DIGOXIN: Might increase the risk of cardiac toxicity due to potassium loss.

MAOIs: Might increase their effects.

HEART DISEASE: Licorice is contraindicated in congestive heart failure.

LIVER DISEASE: Licorice is contraindicated in cholestatic liver disorders and liver cirrhosis.

DIABETES: Contraindicated; licorice can interfere with blood glucose control.

HYPOKALEMIA, RENAL INSUFFICIENCY, AND HYPERTONIA: Contraindicated.

DOSAGES

1-4 g of the powdered root or one cup of the tea three times daily.

PERIOPERATIVE CONCERNS

May cause high blood pressure, swelling or electrolyte imbalance.

PREOPERATIVE DISCONTINUATION

No data.

SAW PALMETTO

COMMON USES

Saw palmetto is used for **benign prostatic hyperplasia (BPH)** and urinary inflammation. Saw palmetto is used in combination with seven herbs (**PC-SPES**) to treat prostate cancer.

MECHANISM OF ACTION

It is believed that saw palmetto inhibits dihydrotestosterone binding at androgen receptors and 5-alpha-reductase activity on testosterone, preventing the conversion of testosterone to DHT. Besides possible hormonal mechanisms, saw palmetto might inhibit growth factors and exert anti-inflammatory effects.

ADVERSE REACTIONS

Headache, or may cause erectile dysfunction, ejaculatory disturbance, or altered libido.

POSSIBLE INTERACTIONS WITH DRUGS OR DISEASES

ORAL CONTRACEPTIVES, HORMONE THERAPY: Concomitant use can interfere.

DOSAGES

1-2 g daily

PERIOPERATIVE CONCERNS

No data

PREOPERATIVE DISCONTINUATION

No data.

ST. JOHN'S WORT

COMMON USES

St. John's WORT is used for mild to moderate **depression or anxiety**, and sleep disorder.

MECHANISM OF ACTION

Inhibition of neurotransmitter reuptake, monoamine oxidase inhibition is unlikely.

ADVERSE REACTIONS

Vivid dreams, restlessness, agitation, irritability, gastrointestinal discomfort, fatigue, dry mouth, dizziness, and headache.

POSSIBLE INTERACTIONS WITH DRUGS OR DISEASES

ANTIDEPRESSANTS: Concomitant use can lead to increase adverse effects and increase the risk of serotonergic side effects.

BARBITURATES, BENZODIAZEPINES, OR OTHER SEDATIVE DRUGS: Might increase risk of sedation.

DIGOXIN: Might reduce serum level.

PROTEASE INHIBITORS: Might reduce serum concentration.

THEOPHYLLINE: Might reduce serum levels and the therapeutic effects.

CYCLOSPORINE: May decrease plasma cyclosporine levels.

WARFARIN: Concomitant use might decrease the therapeutic effects of warfarin.

OTHER DRUGS: Based on documented interactions with St. John's Wort and drugs metabolized by **cytochrome P450** and St. John's Wort's effects on **P-glycoprotein**, use caution when considering concomitant use of St. John's Wort and other drugs affected by these systems. Drugs which might be affected include some **calcium channel blockers** (diltiazem, verapamil, nicardipine), **chemotherapeutic agents** (etoposide, paclitaxel, vinblastine, vincristine, vindesine), **antifungals** (ketoconazole, itraconazole), **glucocorticoids**, **cisapride** (propulsid), **losartan** (cozaar), **fluoxetine** (Prozac), **omeprazole** (prilosec), **fexofenadine** (allegra), possible interaction with **MAOIs** (not

proven) and others.

DOSAGES

300 mg three times daily

PERIOPERATIVE CONCERNS

May prolong effects of anesthesia. Induction of cytochrome P450 enzymes, affecting cyclosporine, warfarin, steroids, protease inhibitors, and possibly benzodiazepines, calcium channel blockers, and many other drugs; decreased serum digoxin levels.

PREOPERATIVE DISCONTINUATION

At least 5 days before surgery.

VALERIAN

COMMON USES

Mild **sedative** or sleep-aid; also a **muscle relaxant**.

MECHANISM OF ACTION

Valerian is reported to have sedative-hypnotic, anxiolytic, antidepressant, anticonvulsant, and antispasmodic effects.

ADVERSE REACTIONS

Headache, excitability, cardiac disturbances, and insomnia.

POSSIBLE INTERACTIONS WITH DRUGS

ALCOHOL: Valerian can potentiate the sedative effects of alcohol.

BARBITURATES, BENZODIAZEPINES, AND OTHER DRUGS WITH SEDATIVE PROPERTIES: Concomitant use can additive therapeutic and adverse effects.

DOSAGES

One cup of the tea taken one to several times per day. The maximum dose is 15 g of the root per day.

PERIOPERATIVE CONCERNS

Potential to **increase sedative effect of anesthetics**; benzodiazepine-like acute withdrawal; potential to increase anesthetic requirements with long -term use.

PREOPERATIVE DISCONTINUATION

No data.

**Effects of herbal medications and recommendations
for discontinuation of use before surgery**

Herb (other names)	Relevant effects	Perioperative concerns	Recommendations
Echinacea	Boosts immunity	Allergic reactions, impairs immune suppressive drugs, can cause immune suppression when taken long-term, could impair wound healing.	Discontinue as far in advance as possible, especially for transplant patients or those with liver dysfunction.
Ephedra (ma huang)	Increases heart rate, increases blood pressure	Risk of heart attack, arrhythmias, stroke, interaction with other drugs, kidney stones.	Discontinue at least 24 hours before surgery.
Garlic (ajo)	Prevents clotting	Risk of bleeding, especially when combined with other drugs that inhibit clotting.	Discontinue at least 7 days before surgery.
Ginko (duck foot, maidenhair, silver apricot)	Prevents clotting	Risk of bleeding, especially when combined with other drugs that inhibit clotting.	Discontinue at least 36 hours before surgery.
Ginseng	Lowers blood glucose, inhibits clotting,	Lowers blood-sugar levels. Increases risk of bleeding. Interferes with warfarin (an anti-clotting drug).	Discontinue at least 7 days before surgery.
Kava (kawa, awa, intoxicating pepper)	Sedates, decreases anxiety	May increase sedative effects of anesthesia. Risks of addiction, tolerance and withdrawal unknown.	Discontinue at least 24 hours before surgery.
St. John's wort (amber, goatweed, Hypericum, klamathweed)	Inhibits re-uptake of neuro-transmitters (similar to Prozac)	Alters metabolisms of other drugs such as cyclosporin (for transplant patients), warfarin, steroids, protease inhibitors (vs HIV). May interfere with many other drugs.	Discontinue at least 5 days before surgery.
Valerian	Sedates	Could increase effects of sedatives. Long-term use could increase the amount of anesthesia needed. Withdrawal symptoms resemble Valium addiction.	If possible, taper dose weeks before surgery. If not, continue use until surgery. Treat withdrawal symptoms with benzodiazepines.

Herb	JAMA article: potential side effect risks	ASA pamphlet: potential side effect risks
Echinacea	Immune suppression (could interfere with wound healing)	liver inflammation in combination with certain drugs
Ephedra (ma huang)	Heartbeat irregularities	blood pressure and/or heart rate
Feverfew		bleeding
Garlic	bleeding	bleeding
Ginger		bleeding
Ginkgo biloba	bleeding	bleeding
Ginseng	bleeding; low blood sugar	blood pressure and/or heart rate; interaction with anticlotting medications
Goldenseal		high blood pressure; swelling
Kava	increase anesthesia effects	increase antiseizure medication and/or anesthesia effects
Licorice		high blood pressure; swelling; electrolyte imbalances
Saw palmetto		interact with other hormone therapies
St. John's wort	increase metabolism of drugs used before and after operations	prolong anesthesia effects
Valerian	increase anesthesia effects	increase antiseizure medication effects or prolong anesthesia effects

Recommendations

- Anesthesiologists should ask patients if they are taking any herbal medications.
- Surgeons should also ask their patients about any herbal medications or multi-vitamins, which may contain herbs.
- It is wise to be familiar with all the common herbs and their drug interactions.
- If a patient is on any herbal remedy on the day of surgery, let the patient know of any potential side effects and intraoperative complications. Also make sure to involve the surgeon in the final decision.
- If the procedure has an increased potential of blood loss, or if the patient is susceptible to increased blood loss, keep alternatives in mind. With consultation of patient and surgeon, some elective cases may be cancelled.

HERB-DRUG INTERACTION

Potential Interactions Between Drugs and Commonly Used Natural Medicines

DRUGS

NATURAL MEDICINE

Aspirin

Licorice

Naloxone (Narcan)

Yohimbe

Narcotics

St. john's Wort

NSAIDs

Feverfew, Licorice

Protease inhibitors

St. john's Wort

Macrolide Antibiotics

Digitalis

Penicillin

Guar Gum

Quinine

Digitalis

Anticoagulants/Antiplatelets

Ginseng, Garlic, Ginkgo, Goldenseal,

Feverfew.

Heparin

Goldenseal

DRUGS

NATURAL MEDICINE

Warfarin

Ginseng, Ginkgo, St. john's Wort.
Danshen, Papain, Belbery, Devils
Claw, Guarana.

Antihypertensives

Ginger, Licorice, Goldenseal,
Yohimbe.

Beta-Blockers

Coffee, Yohimbe

Calcium Channel Blockers

St. john's Wort

Digoxin

Digitalis, Ephedra, Licorice,
St. john's Wort, Guarana, Hawthorn.

Clonidine

Yohimbe

Thiazide Diuretics

Ginkgo

K-Depleting Diuretics

Licorice, Guarana

Reserpine

St. john's Wort

5-HTI Agonists ("Tritans")

St. john's Wort

SSRIs

St. john's Wort

Antidepressant

St. john's Wort

MAOIs

Ginseng, Ginkgo, Ephedra, Coffee,
Caffeine, Cocoa, Yohimbe, Guarana

Tricyclics

St. john's Wort, Yohimbe

CNS Depressants

Kava, Hawthorn, Melatonin

DRUGS

NATURAL MEDICINE

Alcohol

Kava, Ginseng, Valerian

CNS Stimulants

Ginseng

Levodopa

Kava

Sedatives

Kava, Ginseng, Goldenseal, Valerian

Barbiturates

Kava, Valerian, St. john's Wort,
Ginger, Ginseng, Goldenseal

Benzodiazepines

Kava, Valerian

Oral Hypoglycemics

Ginseng, Ephedra, Garlic, coffee

Corticosteroids

Licorice

Hormone Therapy

Ginseng, Licorice, Saw Palmetto

Oral Contraceptives

Saw Palmetto, St. john's Wort

Oxytocin

Ephedra

Cyclosporine

St. john's Wort

Immunosuppressants

Echinacea

Photosensitizing Drugs

St. john's Wort

Theophylline

Ephedra, Caffeine, St. john's Wort

SOME BRAND NAME NATURAL PRODUCTS- WHAT THEY CONTAIN

METABOLIFE 356

Each tablet contains:

- Guarana (contains **caffeine** 40 mg)
- Ma huang (contains **ephedrine** 12 mg)
- Siberian **Ginseng**
- **Ginger** root
- **Goldenseal**
- Lecithin
- Damiana
- Sarsaparilla root
- Gotu Kola
- Spirulina Algae
- Bee Pollen
- Nettle Leaf
- Royal Jelly
- Bovine Complex
- Other ingredients: Vitamin E 6 IU, Magnesium Chelate 75 mg, Zinc Chelate 5 mg, and Chromium Picolinate 75 mg.

PC-SPES

Each capsule contains:

- **Licorice** (Glycyrrhiza glabra, Glycyrrhiza uralensis)
- Da Qing Ye (Isatis indigotica)
- San Qi (**Panax Pseudoginseng**)
- Reishi Mushroom (Ganoderma lucidum)
- Baikal Skullcap (Scutellaria baicalensis)
- Chrysanthemum (Dendranthema morifolium)
- Rabdosia Rebescens
- **Saw Palmetto** (Serenoe repens)

PC-SPES has been available commercially since 1996. “PC” stands for prostate cancer and “SPES” is Latin for hope. It contains licorice and panax-pseudoginseng (both have estrogenic activity) and saw palmetto (which inhibit 5-alpha reductase i.e antiandrogenic effect).

Reported side effects of PC-SPES include lowered libido, erectile dysfunction, hot flashes, breast tenderness/enlargement, reduction in overall body hair, pitting edema, significant drop in lipoprotein a, and **venous thrombosis**.

A.S.A.P.

Ingredients: Black Cohosh root, Passionflower herb, Scullcap herb, Valerian root, Lobelia leaf, Prickly Ash bark.

AD-FX

Ingredients: HT-1001 biologically standardized extract (American Ginseng containing > 15% ginsenosides) 125 mg, Ginkgo biloba standardized extract 29 mg (containing >4% terpenelactones).

ADAPTRIN

Ingredients: Iceland Moss, Red Sandalwood, Hardy Orange, Betraver, Margosa, Spiral Flag, White Sandalwood, Cloves, Columbine, Wild Lettuce, Marigold, Knotgrass, Licorice, Valerian, Camphor bark, Gypsum, Cardamon, Jamaican Pepper, Ribwort (plantain), Heartleaved Sida, Myrobalan, Blackthorn, Golden Cinquefoil, Gingerlily, Homeopathic Monkshood.

ALLERGIA

Ingredients: Bitter Orange, Ginger, Panax Ginseng, Blackberry, Kudzu, HerbaSwee (Cucurbitaceae fruit)

AM PLUS (BRAIN 111 FORMULA)

Ingredients: Ginkgo Biloba, Korean Ginseng, Ginger root, Echinacea augustifolia, Beet root powder, Peppermint leaves, Licorice root, Aloe Vera, Kava Kava.

AMERICAN GINSENG

Ingredients: American Ginseng root, Licorice root, Ginger rhizome, Cinnamon bark, Sarsaparilla root, Dong Quai root.

Diet-Metabo-7

Ingredients: Green Tea leaf extract, Guggul Yogaraj Gum Resin, Kola nut extract, Dandelion extract, Yerba Mate extract, Bupleurum root, Horse Chestnut extract, Bladderwrack extract, Ginkgo Biloba leaf extract, Ginger root, Black Pepper fruit extract, Iodine.

GINKOGIN

Ingredients: Ginkgo, Ginger, Garlic

GINKGO-COMBO GINKGO BILOBA COMPLEX IN VEGETARIAN CAPSULES

Ingredients: Ginkgo Biloba, Capsicum fruit, Gotu Kola root.

MALE ADVANTAGE

Ingredients: Saw Palmetto Berry Fruit Extract, Kava Kava Root, Flaxseed, Pumpkin seed, Korean Ginseng root, Siberian Ginseng root, Turmeric root extract, Damiana leaf,

Pygeum Africana Bark wet extract, Gotu Kola whole plant, Bromelain.

MASCULEX

Ingredients: Muira Puama Powdered extract, Liquid Liver Fractions, Wheat Germ oil concentrate, Mexican Damiana leaves extract, Saw Palmetto Berry extract, Cola Nut, Panax ginseng extract, Ginkgo Biloba leaves extract.

MASCULPLEX

Ingredients: Muira Puama powdered extract, Liquid Liver Fractions, Wheat Germ oil concentrate, Mexican Damania leaves, Saw palmetto Berry extract, Cola nut extract, Panax Ginseng extract, Ginkgo Biloba leaves extract.

MEMORY

Ingredients: Ginkgo Biloba extract, Memorzine, Korean Ginseng.

MEMORY FORMULA

Ingredients: Ginkgo Biloba leaf, Gotu Kola herb, Cayenne pepper, Siberian Ginseng

MEN'S AM MULTI

Ingredients: RoseOx, Citrus Bioflavanoid Complex, Saw Palmetto Berries, Whole Oats, Panax Ginseng Extract, Ginkgo Biloba Leaf, Echinacea, and others.

METAB-O-LITE

Ingredients: Ephedra, Siberian Ginseng, Ginger, Damiana, Sarsaparilla, Gotu Kola, Goldenseal, Nettles.

ONE-A-DAY BEDTIME & REST

Ingredients: Kava Kava, Valerian, Rosemary Leaf

ONE-A-DAY COLD SEASON

Ingredients: Echinacea

ONE-A-DAY ENERGY FORMULA

Ingredients: Ginseng

One-A-DAY MEMORY & CONCENTRATION

Ingredients: Ginkgo biloba

ONE-A-DAY PROSTATE HEALTH

Ingredients: Pumpkin Seed oil, Saw Palmetto extract

ONE-A-DAY TENSION & MOOD

Ingredients: Kava Kava, St. John's Wort

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