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Herbal therapy: a review of potential health risks and medicinal interactions

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Introduction

Complementary and alternative medicine (CAM) is prevalent throughout the world and has been used for centuries to prevent or treat various medical conditions. This form of treatment is sought frequently for chronic conditions such as back pain, anxiety, depression, and fatigue (1–3). CAM encompasses a broad spectrum of diverse practices and beliefs including but not limited to aromatherapy, massage therapy, chiropractic care, acupuncture, relaxation methods, hydrotherapy and herbal therapy.

There are many definitions associated with CAM that are emerging from the literature; however, at this time none have been accepted as the 'standard definition'. Alternative, complementary, unconventional, unorthodox, integrative, or holistic medicine are just a few terms commonly utilized throughout the literature (4–7).

Complementary and alternative medicine refers to treatment that combines two groups or more of diverse medical practices and products that diagnose, treat, and/or prevent disease, in conjunction with biomedical medicine. CAM focuses on contributing to the mind, body and sprit of the individual by satisfying a demand not always met by biomedical medicine (7–10).

The most common reason individuals choose to utilize CAM is prevention (10, 11). Several additional reasons may include: ineffectiveness or dissatisfaction with biomedical medicine, enhancement of the immune system, the need for personal control over

health care decisions, and lastly more accessibility than biomedical medicine (5, 12, 13).

Due to the wide-range of therapies of CAM, the author has chosen to focus on herbal therapy, also know as phytotherapy or phytomedicine. The intent of this article is to offer a review of herbal supplements, possible complications and potential biomedical medication interactions.

Terminology

Biomedical medicine is the treatment or medication with a chemical substance prescribed with the intent to cure, treat or prevent disease. The term 'biomedical medicine' was selected instead of 'conventional medicine' since many cultures throughout the world practice 'folk medicine', which has been considered a form of conventional medicine for hundreds or thousands of years (10, 12).

Herbs can be defined as non-woody seed-producing plants that grow as annuals, biennials or perennials and expire at the end of each growing season. Several parts of the plant such as the flower, stem, seed or root can be used for medical or aromatherapy qualities. Herbs can be administratered in forms such as extracts, juices, teas, lozenges, inhalants, oils, salves, capsules, and herbal baths (10).

Many herbs have the same name, but exhibit different properties and reactions to other herbs or biomedical medications. There are several names used to identify a herb. The botanical and/or scientific name will immediately follow the common name. The scientific name in Latin provides positive identification for various species or substances that may share several common names. Common names are not recognized internationally, therefore, one herb can have various names depending on the geographic location.

For example, there are several types of Ginseng. Chinese Ginseng (*Panax ginseng*) is the most common preparation used throughout the world; however, another prevalent form of the herb is American Ginseng (*Panax quinquefolius*). Furthermore, there are several common names for Ginseng such as Asiatic ginseng, Japanese ginseng, Jintsam, or Western ginseng.

Understanding the affects of herbal therapy

The most common reason individuals choose to utilize herbal therapy is prevention (11, 12). Patients desire to have control and options over their life and health care. In particular, patients with incurable diseases value herbal therapy and its medicinal potential. Herbal therapy gives hopefulness, may decrease or alleviate side effects of biomedical medicine and may lack the toxicity of biomedical medicines (5, 12, 13). Herbal therapy is considered risk free and 'natural' by many individuals; and therefore, is preferred over biomedical medications.

Confusing to individuals is the word 'natural', because herbs are interpreted as being 'safe' or 'harmless' and not drugs. Herbal therapy, just like biomedical medicine, can have health risks as well as benefits. Herbs are metabolized similar to biomedical medications. Drug receptors have a difficult time distinguishing between a natural molecule from the plant kingdom or a molecule that is a synthesized chemical from the laboratory (14).

The *therapeutic index* refers to the proportion of the dose of the herb necessary to cause an adverse effect when compared with the dose that is needed to generate a therapeutic effect (4). A high therapeutic index has a broader margin of safety compared with a herb with a lower therapeutic index. The therapeutic index will depend on which herb is being used, the part of the herb used, route of administration and even the manufacturer (13). If the patient consumes the therapeutic dose in one large amount or high frequency, such as everyday for months, the possibility of developing toxicity increases, regardless of how safe research has declared the herb to be (14).

Herbal therapy can lead to hypersensitivity, toxic or adverse reactions. Yohimbine has been associated with a allergic reaction culminating in a lupus-like syndrome (15). Valerian has been reported to contain alkylating agents that can lead to impaired mitochondrial function (12). Adverse reactions commonly associated with St John's Wort include photosensitivity, dizziness, confusion, and sedation. Willow bark is marketed as an aspirin-free product; however, the herb contains an ingredient that can be converted to the same active ingredient as in aspirin and has been reported to cause Reye's Syndrome (12). The World

Health Organization has received over 5000 reports of possible adverse reaction that have been related to herbal therapy (16).

As a result of these types of reports many health care providers jump to dismiss herbal therapy because there is lack of evidence, regulation and reporting of adverse reactions. On the other hand, there are current methods of biomedical medicine being used daily that are not based on solid evidence. Therefore, many individuals believe the risk of using herbal therapy is just as safe as using biomedical medicine.

Any medication, whether herbal or biomedical can be a cure or a poison. In fact, almost all chemical substances are toxic when excessive dosages are ingested. Lazarou and Pomeranz report that 137 000 hospitalized Americans die annually and 2.7 million become seriously ill as a result of adverse reactions from 'properly prescribed and administered' prescription drugs (17). Currently, many health care providers believe adverse reactions of herbal therapy may be under-reported due to the lack of a competent system for tracking such adverse reaction. In addition, many individuals do not believe herbs cause adverse reactions, therefore, do not report the reaction to their health care provider.

The American Association of Poison Control Center and the Food and Drug Administration (FDA) receive any reports of adverse or toxic reactions, serious health problems and/or death associated to the use of a herbal supplements. From 1993 to 1998, the FDA reported 2600 serious medical problems and 184 deaths associated with the use of herbal supplements. The United Kingdom's Medicines Control Agency (MCA) has reported similar statistics. The MCA has found that many herbal supplements contained potentially dangerous and illegal substances such as lead, mercury and arsenic compounds (18).

Government regulations

There are many concerns regarding the regulation, contamination and variability in manufacturing, storage and quality of the herbal supplement. The process in which herbs are grown, harvested and stored can affect the potency and quality of the herbal supplement. *Potency* depends on several factors such as the geographic location, soil, sunlight, rainfall, altitude, drying, harvesting process or storage. Currently there are minimal standards that apply to growing, harvesting, extraction, grinding, processing and packaging of herbs (11). Possible contamination can occur during any of these stages. For example, kelp has been reported to contain arsenic, which affects thrombocytopenia (11,12). Contaminates can include lead, mercury, herbicides, pesticides, radioactive substances, zinc, aluminum and arsenic (4, 9–12).

Many health care providers consider the Germen Commission E monographs to be one of the preeminent resources of information on herbs. The German Federal Health Agency established the Commission E in 1978 to study the safety and efficiency of herbs. This committee's responsibility was to write a series of monographs on the commonly used herbs throughout Germany (9–10). The commission has approved over 400 herbs for medical treatment in Germany. Many of these herbs are sold over-the-counter; however, the stronger herbs require a prescription and many are reimbursable by insurance companies (4,10,19,20).

In addition, the European Economic Community has established guidelines that standardize the quality, dosage, and production of herbal therapy (19). These guidelines are currently based on the World Health Organization's publication, 'Guidelines for the Assessment of Herbal Medicines' that addressed the safety and efficacy of herbal supplements. For example, if the herb has been used without demonstration of harm, no restrictive action should be taken unless new evidence is discovered. A pharmacopoeia monograph should be sufficient reference concerning a particular herb, and if one does not exits, a monograph needs to be supplied or prepared in the same manner as an official pharmacopoeia (10,20).

Currently regulation is the single biggest factor affecting the reliability of herbal supplements in the USA. Herbs are exempt from the regulations that govern biomedical medications (21). The Dietary Supplement Health and Education Act of 1994 regulates herbal and dietary supplements (DSHEA), which has in turn limited regulations by the US Food and Drug Administration (FDA). Biomedical and over-the-counter medications endure pre-clinical studies, pre-marketing control and post-marketing surveillance; as a

result pharmaceutical companies patent these products. However, herbs on the US market have not necessarily been assessed for safety and efficacy (11 and 21). Herbal supplements cannot be patented, because they occur naturally throughout the world.

In addition, manufacturers are permitted to make broad-spectrum health statements; however, no therapeutic statement can be made regarding an herbal supplement. The manufacturer's statement must clearly state that the product is a dietary supplement and must contain a disclaimer stating the FDA has not evaluated any health claims. The following label must be on any herbal supplement marketed in the USA, 'This product is not intended to diagnose, treat, cure or prevent any disease'. The label can also include: detailed directions for use, list precautionary information, warning signs, possible adverse reactions, contraindications, safety data and properties of the products; however, this information is optional.

Herbal supplements and oral health care

The increasing information available to the patient via the Internet and mass media is expanding the health consciousness of our society. Patients are incorporating herbal therapy into their daily oral health care to prevent, treat or cure oral conditions from halitosis to periodontal disease. The following are examples of herbs that have been documented in the literature to prevent or treat oral conditions.

Peppermint, *lavender* or *bergamot teas* or oil drops on the tongue to treat halitosis (4, 22).

Sage and Chamomile mouthrinses to treat or prevent canker sores. Sage is believed to have antioxidant properties and some studies have found that sage extracts have a bactericidal action against a wide range of bacteria, including gram-negative forms (23). Chamomile is commonly used as an anti-inflammatory.

Echinacea and Cleavers use the tincture as a mouthrinse or apply to the site of infection. Echinacea has demonstrated the ability to inhibit streptococcal growth and to stabilize hyaluronic acid (22, 24).

Carline Thistle apply topically to treat aphthous ulcers and cancer of the tongue and there is very little research to support this claim (25).

Karaya Gum used as an adhesive for dentures and lozenges for sore throat (25).

Witch Hazel is commonly used as a astringent in herbal mouthrinses. Witch hazel has been reported to have anti-inflammatory and antiviral properties (4,25).

Myrrh is used in mouthrinses and toothpaste. Myrrh is a natural resin used for cleaning the teeth and has demonstrated some anti-inflammatory and analgesic properties (26).

Propolis is also used in mouthrinses and toothpaste. Propolis has been reported to have antiviral action against herpes simplex virus type I (27), antibacterial properties against *streptococcus mutans* (28) and anti-inflammatory properties (29,30).

Several herbs have been found to cause not only adverse systemic reactions but also adverse oral consequences; however, the dosage of the herb that causes the adverse reaction can vary greatly from individual to individual.

Echinacea has been reported to cause tongue numbness possibly because of decreased impulse transmission along the sensory nerves which occurs when taking this herb (4,6,13,20).

Feverfew and Ginkgo have caused increased gingival bleeding because of the antiplatelet activity of the herb (11,12,21).

Blue Cohosh, *sage tea and feverfew* have been shown to cause oral irritation, frequent use of feverfew can result in the development of aphthous ulcers and swelling of the tongue and lips (6,10,12).

Goldenseal like feverfew will also cause oral ulcers and inflame the mucous membranes (6,10,12,21).

Mint especially peppermint when used in high concentrations orally, will irritate the tissues so much that a contact dermatitis develops (10,12).

Yohimbe causes excessive salivation where as betel nut, chaste tree, sage and St John's Wort consumption results in the development of xerostomia (6,10–12,21).

Kava has been linked with oral and lingual dyskinesia most likely due to its ability to effect motor functioning (4,6,10,26).

It is important that dental providers improve their knowledge base concerning the oral manifestations associated with herbal therapy. This knowledge can

then be used when identifying the causes of these lesions and educating patients on the systemic and oral effects of herbal therapy (6,10,21).

Potential biomedical medication interactions

Herbs have helped form the foundation for modern day biomedical medications. Interestingly, about one-fourth of all biomedical medications commonly prescribed today contain at least one active ingredient derived from plants, and additional contents are chemically synthesized in the laboratory (4,10). Examples of common plant based medications include: *aspirin* with a botanical origin from white willow bark and the acid meadow sweet plant; *codeine and morphine* with a botanical origin from opium/poppy; and *digoxin* with a botanical origin from foxglove.

Biomedical medications, whether prescription or over-the-counter may be affected by the use of herbal therapy. The simultaneous use of biomedical medications and herbal therapy can interfere with the pharmcokinetic or pharmacodynamic of any medication. Pharmcokinetic interactions involve the increase or decrease in the amount of the medication available to produce a therapeutic effect (4,12). For example, utilizing a herb and biomedical medication concurrently can interfere with the absorption, distribution, metabolism and excretion of each. Pharmacodynamic interactions affect the action of the medication by enhancing or antagonizing the effect of the medication or herb on the human body (4,26).

Throughout the literature potential interactions between biomedical medications and herbs have been documented. A patient's bleeding time can be altered when warfarin is concurrently used with herbs such as danshen, dong quai, feverfew, ginger, ginkgo, or garlic (30). Ginseng decreases the anticoagulant effect of warfarin and increases digoxin levels (22). This herb has been reported to interact with monoamine oxidase inhibitors such as phenelzine (24,25). Kava may increase the potency of medications or other herbs that act on the central nervous system such as alcohol, barbiturates and psychopharmacological agents (26). Ginkgo, garlic, danshen and dong quai have an anticoagulant effect, therefore, increasing the risk of bleeding during anesthesia and surgery (4,26).

The table within this article identifies commonly used herbs and the potential uses. The most common uses are in bold, as well as side effects with biomedical medications and oral and systemic health complications (1,4,8,11,20,24,26) (Table 1).

Herbal therapy and the consumer

Health care providers can educate patients that herbal therapy is not always free of allergic or adverse reactions. For example, some berries that grow in the wild are safe while others are hazardous. Focus on giving advice and support to patients who are keen on integrating herbal therapy into their everyday health care should insure that these patients are aware of the advantages, as well as the disadvantages and possible adverse reactions of using herbs with biomedical medications.

Three of every 10 patients using herbal therapy reveal this information to their health care providers without being questioned (1) This may be because the patient believes herbs are natural, therefore no adverse reactions can occur, or the patient is embarrassed of being labeled unsophisticated. The health care provider has an obligation to always ask about any types of CAM and provide education and advice when appropriate. The provider can play an important role in reducing unintentional toxicity of herbal therapy by recording, reviewing and discussing adverse reactions and contraindications when collecting information in regards to the patient's social and medical history.

In order to provide better health care services to patient, the health care provider should discuss the following information when a patient is thinking about or already using herbal therapy on a daily basis.

- Herbal products need to be treated as pharmaceutical products and not food.
- If taking biomedical medications consult with a health care provider such as a physician or a CAM practitioner before using herbal therapy.
- Inform health care providers of herbal therapy or an form of CAM.

Table 1. **Common herbs and potential interactions**

Common name and (scientific name)	Potential common uses	Potential conventional and herbal drug interaction	Potential side effects or adverse reactions
Aloe (*Aloe vera*, *Aloe perryi*, *Aloe ferox*, *Aloe spicata*)	Wound healing laxative	Many drugs when taken orally: Antiarrhythmics Antidiabetics Loop diuretics Systemic steroids Thiazides Herbs: Jimsonweed and Licorice	Taken internally can cause: Intestinal mucosa damage Nephrotoxicity Cardiovascular hyperactivity Decrease effectiveness of many drugs
Bee Pollen (no scientific name)	Immune system Altitude sickness Diuretic GI ulcers Improve stamina Increase appetite	Antidiabetics Possible interactions with many prescription and over the counter drugs	Acute hepatitis Previous pollen allergies can result in anaphylaxis when taking supplement
Betel Nut (*Areca Catechu*)	Psychostimulant recreational drug	Anticholinergic	Interferes with anticholinergic drugs Aggravate asthma CNS stimulation Long-term use can result in development of cardiovascular disease, diabetes, asthma and oral cancer Gingivitis, periodontitis, increased salivation
Bilberry (*Vaccinium myrtillus*)	Vision Disorders Glaucoma Night blindness	Anticoagulants Antiplatelets Aspirin NSAIDs Oral antidiabetics and insulin	Constipation Hypoglycemia
Black Cohosh (*Actaea racemosa*, *Cimicifunga racemosa*)	Hormonal therapy Muscle relaxant	Antihypertensives Hormone replacement therapy Oral contraceptives Sedatives/Hypnotics	Increase bleeding time Lower blood glucose levels Slow heart rate
Bloodroot (*Sanguinaria canadensis*)	Analgesic Antifungal Anti-inflammatory Antimicrobial Antiplaque	Antihypertensives	CNS depression Hypotension
Blue Cohosh (*Caulophyllum thalictroides*)	Uterine stimulate Anticonvulsant Induce labor Menstrual problems	Antidiabetics Antianginals Antihypertensives Nicotine	Embryotoxic – causes MIs and chronic heart failure Leaves and seeds can cause stomach poisoning Nicotine toxicityPowder form is irritating to the mucous membrane

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Table 1. **Continued**

Common name and (scientific name)	Potential common uses	Potential conventional and herbal drug interaction	Potential side effects or adverse reactions
Capsicum Peppers (*Capsicum frutescens*, *Capsicum annum*)	Arthritis Chronic muscular pain Diabetic neuropathy Gastroprotective agent Herpes Zoster Raynaud's disease	Antiplatelets Aspirin Barbiturates Clonidine MAOIs Methyldopa	Hepatic or renal damage with long-term use Painful irritation of mucous membrane with topical use
Cascara Sagrade (*Rhamnus purshiana*)	Laxative Cancer Gallstones Liver ailments	Antacids Antiarrhythmics Cardiac glycosides Corticosteroids Thiazides Herbs: Adonis, Convallaria, Helleborous, Licorice root, Jjimsonweed and Strophanthus	Long-term use can lead to electrolyte imbalance Contraindicated for use in individuals who have: Angina/heart disease Anxiety Depression – leads to suicides Diabetes Hypertension Hypotension Kidney disease Prostate inflammation Schizophrenia – increases psychoses
Cat's Claw (*Uncaria tomentosa*, *Uncaria guianensis*)	Immune stimulant Anti-inflammatory Colitis Contraceptive Crohn's disease Irritable bowel syndrome	Antihypertensives Halcion Immunostimulants Insulin Mevacor Nizoral	Contraindicated for individuals who have: HIV/AIDS Hypotension GI upset
Chamomile (*Matricaria chamomilla*, *Matricaria recutitia*, *Chamaemelum nobile*, *Anthemis nobile*)	Anti-inflammatory Anxiety Insomnia Canker sores Mild sedative Menopause Wound healing	Alcohol Anticoagulants Benzodiazepines Hormone replacement *In-vitro* fertilization Oral contraceptives Sedatives	Hypersensitivity when allergic to ragweed or asters Increases asthmatic problems Large doses causes GI upset Topical use burning of the face, eyes and mucous membrane Unsafe herb for pregnant or breast feeding mothers
Chaste Tree (*Vitex agnus castus*)	Menopausal Symptoms Menstrual disorders Impotency Infertility Pituitary problems	Antipsychotic medications Hormone replacement therapy *In-vitro* fertilization Oral contraceptives	GI upset Rash and itching Severe depression Dry mouth
Chondroitin sulfate (*Chrondroonitin-4-sulfate*)	Osteoarthritis Ophthalmic solution Osteoporosis Iron deficiency anemia	Anticoagulants NSAIDs	Exacerbates asthma Headaches Increase bleeding Possible renal failure

Table 1. **Continued**

Common name and (scientific name)	Potential common uses	Potential conventional and herbal drug interaction	Potential side effects or adverse reactions
Coenzyme Q10 (*Ubiquinte*, *Ubidecarenone*, *Mitoquinone*)	Heart disease Bell's palsy Infertility Periodontal disease	Anticoagulants Antidiabetics Beta-blockers Phenothiazines Tricyclic depressants	Large dosages GI upset
Cranberry (*Vaccinium macrocarpon*, *Vaccinium oxycoccus*, *Vaccinium erythrocarpum*)	Urinary tract infections Antioxidant Oral antiplaque	Antidiabetics Increased absorption of Vitamin B-12	Can cause kidney stones Interferes with diabetic medications Large dosages GI upset
DHEA (*Dehydroepiandrosterone*)	Immune Stimulate Artherosclerosis Cancer stimulation Hyperglycemia	Hormone replacement therapy	Acne Irregular heart rhythm
Dong Quai (*Angelica polymorpha sinenis*)	Menopausal Symptoms Menstrual disorders Herpes infections Malaria	Anticoagulants Antiplatelets Herbs: Chamomile, dandelion, Horse chestnut, Red clover and St John's Wort	Affect platelets resulting in increased bleeding Fever Photosensitivity
Echinacea (*Echinacea angustifolia*, *Echinacea pallida*, *Echinacea purpurea*)	Immune Stimulant Immune Support Antibacterial Antiviral Colds Fungal infections Influenza	Anabolic steroids Amiodarone Immunosuppressants Ketoconazole Methotrexate	Contraindicated for autoimmune diseases or progressive infectious diseases such as: HIV/AIDS, tuberculosis, or multiple sclerosis Interfere with sperm enzyme activity Use beyond 8 weeks without 3 week rest period can result in: Acute asthma attacks, Hepatoxicity and Suppress immune system Tongue numbness
Ephedra/Ma huang (*Ephedra sinica*, *ephedra nevadensis*, *ephedra trifurca*)	Weight loss Asthma Nasal congestion CNS stimulation	Antidiabetics Beta-blockers Corticosteriods Epinephrine General anesthetics Halothane MAOIs Tricyclics Xanthines Herbs: bitter orange, coffee, ginseng, green tea, guarana, kola nut, malvaceae, siberian ginseng, St John's wort and Soapwort	Arrhythmias Cardiac arrest Decreased effect of steroids Hypertension Myocardial infraction Stoke

Table 1. **Continued**

Common name and (scientific name)	Potential common uses	Potential conventional and herbal drug interaction	Potential side effects or adverse reactions
Eucalyptus (*Eucalyptus globules*)	Respiratory congestion Antiseptic for wounds CNS stimulant Irritable bowel syndrome	Amphetamines Antidiabetics Barbiturates Herbs: Borage, coltsfoot, comfrey and Hound's tooth – toxicity	Alter drugs metabolized by the liver Damage to GI tract Hypotension Kidney inflammation Not recommended for diabetics Severe liver damage
Evening primrose oil (*Oenothera biennis*, *Primula elatior*)	Arthritis Alcoholism Cardiovascular disease Digestive disorder Multiple sclerosis Skin disorders Weight loss	Anticonvulsants General anesthetics	Immunosuppression with long-term use Lower seizure threshold
Feverfew (*Chrysanthemum parthenium*)	Arthritis Fever Menstrual problems Migraine headaches Mouth rinse after extractions	Anticoagulants Antiplatelets Aspirin	Increased risk of bleeding Oral/aphthous ulcers, lip and tongue irritation, and prolonged gingival bleeding
Fish oil (no scientific name)	Depression Blood cholesterol Skin conditions	Anticoagulants Antidiabetics Antihypertensives Antipsychotic Oral contraceptives	Decrease blood coagulation Decrease pulmonary functioning in aspirin sensitive individuals More than 3 g/day may adversely affect the immune system Not recommended for bi-polar individuals Not recommended for HIV/AIDS patients or others who are immunocompromised Some brands contain high levels of mercury and heavy metals
Garlic (*Allium sativum*)	Antilipidemic antimicrobial Antiasthmatic Antidiabetic Antihypertensive Antioxidant Immune stimulant	Anticoagulants Antidiabetics Aspirin General anesthetics Saquinavir Herbs: acidophilus	Hypothyroidism Inactivates the effects of saquinavir increased bleeding Irritation of the oral cavity, burning of mouth and halitosis

Table 1. **Continued**

Common name and (scientific name)	Potential common uses	Potential conventional and herbal drug interaction	Potential side effects or adverse reactions
Ginger (*Zingiber officinale*)	Nausea, Antioxidant Morning sickness Motion sickness Migraine headaches	All oral medications may have increased absorption Large doses can interfere with: Anticholinergics Anticoagulants Antiplatelets Aspirin Digitalis Iron and fat-soluble vitamins Tetracycline	Alters prothrombin time Has been found to cause liver damage in animals Large doses carry potential for causing depression and cardiac arrhythmias
Gingko (*Ginkgo Biloba*)	Dementia Antioxidant Glaucoma Menopausal symptoms Multiple sclerosis Sexual dysfunction	Aspirin Anticoagulants Anticonvulsants General anesthesia MAOIs Thiazides	Affects prothrombin time – increase bleeding GI upsets Headaches Increased bleeding during minor gingival injuries
Ginseng (*Panax quinquefolius*, *Panax ginseng*)	Stress Improve concentration Lessen fatigue – physical endurance Sexual potency	Anticoagulants Anticonvulsants Antidiabetics Estrogen Immunosuppressants MAOIs Phenelzine sulfate Stimulants Herbs: Ephedra	Additive effect of drugs Altered bleeding time Alters blood glucose levels Hypertension Manic episodes Palpitations Tremors
Glucosamine Sulfate (*2-amino-2-deoxyglucose sulfate*)	Osteoarthritis Glaucoma Rheumatoid arthritis TMJ discomfort	Acetominophen Antidiabetics Cancer chemotherapy drugs	Decrease insulin levels in diabetics Exacerbates asthma Increased blood lipid levels Increased blood pressure Resistance to chemotherapy drugs
Goldenseal (*Hydrastis canadensis*)	Inflamed mucous membranes	Antiarrhythmics Anticoagulants Antihypertensives Azole antifungals Barbiturates Benzodiazepines Beta-blockers CNS depressants Lovastatin Vitamin B absorption	Bradycardia GI problems Increased coronary blood flow and heart stimulation and effects blood pressure levels Large dose can cause nausea, vomiting, a decrease in white blood cell count and causes neuropathy Not recommended for patients with HIV/AIDS Oral ulcers

Table 1. **Continued**

Common name and (scientific name)	Potential common uses	Potential conventional and herbal drug interaction	Potential side effects or adverse reactions
Green tea (*Camellia sinensis*)	Antioxidant Anticancer Antilipidemic Antiatherosclerotic	Antacids Atropine when taken orally Bronchodilators MAOIs Xanthines Herbs: Ephedra	Anemia in infants Associated with increase risk of esophageal cancer Contains at least 40 mg of caffeine Increase blood pressure Irregular heartbeat
Hawthorn (*Crataegus*)	Cardiovascular disorders	Antianginal Antiarrhymics Antihypertensives Beta-blockers CNS depressants Digoxin Herbs: adonis, lily of the valley and squill	Check with physician before taking if individual has cardiac disorders
Horse chestnut (*Aesculus hippocastanum*, *Aesculus California*, *Aesculus glabra*)	Anti-inflammatory Edema Fever Varicose veins	Anticoagulants Antidiabetics Aspirin	Bruising Increase bleeding Muscle spasms Nephrotoxicity
Karaya Gum (*Sterculia urens*)	Laxative Adhesive for colostomy appliance and partials/ dentures Sore throats	Decreases absorption of all drugs and all herbs; separate dosages by at least 2 h	Gastrointestinal obstruction
Kava (*Piper methysticum*)	Sedative Sleep inducers Analgesic Anxiolytic Muscle relaxant	Antiparkinsonians Antipsychotics Barbiturates Benzodiazepines CNS System Depressants General anesthetics	Additive effect has resulted in comas Do not drive or operate heavy or dangerous equipment Do not take this supplement for more than 3 months Drowsiness Increased CNS depression Long-term use can cause disturbance of coordination between vision and movement Oral and lingual dyskinesia
Licorice (*Glycyrrhiza glabra*)	Arthritis Addison's disease Adrenal insufficiencies Stress	Antiarrhythmics Antihypertensives Aspirin Azole antifungals Corticosteroids (oral and topical) Digoxin Diuretics	Cardiovasular hyperactivity Increased blood glucose levels Increases the strength and causes an antagonistic effect of diuretics

Table 1. **Continued**

Common name and (scientific name)	Potential common uses	Potential conventional and herbal drug interaction	Potential side effects or adverse reactions
Melatonin (*N-acetyl-5-methoxytryptamine*)	Insomnia Alzheimer's Fibromyalgia Chronic fatigue syndrome	Anticoagulants Benzodiazepines Beta blockers CNS stimulants – caffeine Cerebral stimulants DHEA Magnesium	Decreased blood glucose utilization Decrease progesterone, estradiol an dLH levels Tachycardia Increases systolic blood pressure Interferes with immunosuppresive therapy Increases seizure activity in individuals with neurological disorders
Milk Thistle (*Silybum marianum*)	Cirrhosis of liver Chronic Candidiasis Hepatitis C Hepatotoxicity	Acetaminophen General anesthetics	GI upset Menstrual changes Use should be monitored by physician
Mint (*Mentha piperita*, *Mentha spicata*)	GI problems Arthritis Common colds Cold sores Halitosis Motion sickness	Antacids Gastric blocking drugs	Concentrations of peppermint oil should be used in low doses only Mucous membrane irritation and contact dermatitis occurs when high doses of peppermint oil contact skin surfaces
Stinging nettle (*Urtica dioica*)	Arthritis Diuretic Prostate cancer Respiratory conditions Urinary tract disorders	Anticoagulants Antidiabetics Antihypertensives CNS depressants Lithium	Hypotension Increase chronic heart failure Possible kidney dysfunction Safety during pregnancy is unknown Skin irritation
St John's Wort (*Hypericum perforatum*)	Depression Anti-inflammatory Antimicrobial	ACE inhibitors, loop diuretics, thiazide diuretics Alcohol Antidepressants, tricyclics Antiretrovirals (indinavir) Benzodiazepines Immunosuppressants MAOIs NSAIDs Oral contraceptives Serotonin reuptake inhibitors (SSRIs) Sulfonamides Tetracyclines Traxodone	Decreases bioavailability of drugs including birth control Decreases blood plasma concentrations in heart transplant patients Fatigue GI upset Inhibit the absorption of iron due to Tannic acid Photosensitivity Serotonin syndrome Dry mouth

Table 1. **Continued**

Common name and (scientific name)	Potential common uses	Potential conventional and herbal drug interaction	Potential side effects or adverse reactions
Sage (*Salvia officinalis*)	Wound healing GI disorders Menstrual disorders Sore throats	Anticonvulsants Hypoglycemic Sedatives	Can cause seizures Inflammation of lips and lining of mouth from ingestions of sage tea Dry mouth
Saw palmetto (*Serenoa repens*, *Sabul serrulata*)	Benign Prostatic Hyperthrophy	Anticoagulants Antiplatelets Hormonal therapy Oral contraceptives NSAIDs Iron supplements	Back pain GI upset Headaches Inhibits iron absorption due to Tannic acid content
Siberian Ginseng (*Acanthopanax senticosus*, *Eleutherococcus*, *senticosus*, *Hedera senticosa*)	Physical endurance Anti-inflammatory Insomnia	Antidiabetics Digoxin Kanamycin Xanthines Herbs: Ephedra	Hypertension Increase bleeding Increase estrogen levels
Valerian (*Valeriana officinalis*)	Nerve disorders Sleep inducer	Barbiturates Benzodiazepines General anesthetics MAOIs Opioids Phenytoin Sedatives Warfarin	Additive effects – excessive sedation and possible coma, CNS depression Anticholinergics poisoning when taken in large doses Habit forming
Xaio chai hu tant (*Monascum purpureus*, *Monascum anka*)	Hypercholestermia GI upset	Prednisone	Contraindicated for individuals with hepatic diseases Decrease blood concentration of drug
Yohimbe Bark (*Pausinystalia yohimbe*)	Sexual dysfunction Angina Aphrodisiac Exhaustion GI problems	Antidiabetics Alpha 2 Adrenergic blocking Antihypertensives Beta blocking MAOIs Naloxone Phenothiazines Prednisone Sympathomimetics Tricyclic antidepressants Herbs: California poppy, Ginkgo, Mace and St John's Wort	Cardiac failure and death Hypertension and hypotension Manic reactions in psychiatric patients Nephrotoxicity Paralysis Severe toxicities Increased salivation

- Purchase products that have labels that state the name of herb, name and address of manufacturer, a lot number, manufacture date and date of expiration.
- Take one herbal remedy at a time and do not take herbal supplements at the same time as a biomedical medication.
- Start with lowest recommend dose and gradually increase.
- Observe desired effect, report undesired effects and immediately discontinue if adverse effects such as allergic reactions in the form of a skin rash, difficulty breathing, or long-term headaches occur when using the herb.
- Do not give herbal products to infants, young children, pregnant or lactating women or elderly without talking with a physician or CAM practitioner.

Conclusion

When a patient is using or inquiring about herbal therapy this is an opportunity to discuss and share methods of CAM, to further understand the patient's outlook on health care, and lastly, the clinician can focus on the genuine needs of the patient. The provider needs to keep in mind that a patient is using herbal therapy or any form of CAM may not be dissatisfied with biomedical medicine. Instead, the patient may be seeking treatment for more than the disease or illness. They may be focusing on the importance of treating the mind, body and spirit. Treating the whole person allows the patient to maintain their overall health and enhance their quality of life.

Therefore, it is essential that health care providers become knowledgeable about the common herbs that patients may be using. Interaction of these herbs with biomedical medications and the impact that herbal therapy can have on a person's systemic and oral health is significant. The health history needs to include questions inquiring about the patient's use of herbal therapy or any type of CAM. It is also imperative to specifically ask during the course of treatment, 'Are you considering or using any herbs and/or dietary supplements?' and 'Why are you using herbs and/or dietary supplements?' Most patients would like a frank and honest discussion about what they are using, and possible adverse reactions with herbal therapy. These efforts will augment knowledge and awareness to the patient and health care provider on the potential uses and effects of herbal therapy to improve the quality of life.

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