

# Defining Complementary and Alternative Medicine in Allergies and Asthma

*Benefits and Risks*

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## Abstract

In this review, the current literature discussing complementary/alternative medicine (CAM) interventions, the prevalence and pattern of use, examples of specific modalities and the risks of CAM for asthma and atopic disease are discussed. The specific risks of CAM interventions associated with the use of these modalities, omission of traditional therapeutic modalities, and the liability risk for physicians who either provide or counsel their patients regarding CAM interventions are also discussed.

## Index Entries

Complementary/alternative medicine (CAM); allergy; atopy; asthma; allergic rhinitis; allergic conjunctivitis; herbal remedies; homeopathy; acupuncture; liability and CAM.

## Complementary and Alternative Medicine: Prevalence and Patterns of Use

The use of complementary and alternative medicine (CAM) has increased markedly in the world-wide population and specifically in the US population. According to recent studies, 42% of the US population with allergies or

asthma has tried some form of CAM (1,2). Other studies have shown that between 20 and 55% of pediatric patients have used some form of CAM interventions in the past year (3–5). This is particularly important for allergists as children suffer disproportionately from atopic disease.

However, the use of CAM interventions in the conventional day-to-day care of patients

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recommended by health care providers is limited by a lack of acceptance due to an inadequate number of randomized placebo-controlled studies used to prove their efficacy. Although there is a paucity of data detailing the mechanisms or even the efficacy of many modalities, one must start to carefully review the literature for CAM interventions that have undergone randomized clinical studies with scientific scrutiny. The design of randomized placebo-controlled studies in CAM is complicated by difficulties in blinding, difficulties in creating an appropriate placebo (particularly for acupuncture) (6), and difficulties in designing a control treatment when the mechanisms of actions of the modality to be tested are poorly delineated. Additionally, the difference in philosophy of CAM interventions from conventional health care allows for significant variation in the way CAM modalities are practiced. Therapies are often individualized for a particular patient and their particular disease state, and results can vary with patient's perception of their interaction with the CAM provider, which is often more personal than the interaction between patients and traditional health care providers (7,8). Thus, study results may easily vary between CAM providers. Although one recent study showed no link between a patient's positive or negative attitude regarding a homeopathy remedy and outcomes in the treatment vs placebo groups (9). In studying the efficacy of CAM interventions, one must also appreciate and assess the importance of placebo effect owing to the relationship that patients have with CAM providers.

As difficult as the design will be, the effort needs to be made to ensure patient safety and to prove efficacy of these modalities (7). It should be remembered that many medications used today in traditional medicine found their origin in herbs and other alternative medicines of the past. As examples, corticosteroids, which are prominently used in the treatment of both asthma and atopic disease, have their origin in

ground placenta and the urine of pubescent boys; the mast-cell stabilizer, cromoglycol, is historically derived from the Middle-Eastern khella plant (10). By establishing mechanisms and efficacy of CAM intervention modalities currently in use, new options for traditional intervention may be discovered and currently used medications may be improved.

Many patients and patients' parents are reluctant to discuss their use of CAM interventions with their physician so it is important that the physicians ask their patients about CAM-intervention use. In order to better assist their patients, physicians should be prepared to discuss some of the benefits and risks associated with various CAM modalities so that patients will feel open to share their CAM experiences with the physician (1,3,11). The importance of inquiring about CAM intervention is exemplified in a survey of 142 pediatric patients seen in the emergency room, 45% of parents reported giving their child an herbal supplement. The most commonly used supplements were aloe, echinacea, sweet oil, eucalyptus, ginkgo, ginseng, and goldenseal. One parent reported the concomitant administration of albuterol and ephedra (4). Many of these patients did not share their use of these therapies with their physicians. This lack of open communication puts the patient at risk of drug interactions leading to therapeutic toxicity or inefficacy of traditional therapies.

CAM interventions are most commonly used for chronic conditions. Although the most common condition associated with CAM interventions is low back pain, asthma and atopic disease are next on the list. Asthma and atopic disease are frustrating to patients because of the lack of a permanent and reliable cure or even a predictable remission (12). Patients generally understand that CAM intervention is not curative, but in some instances, it has been reported to provide some form of benefit in terms of symptom relief and improvement in quality of life issues (5). In regard to CAM interventions for the treatment of allergic dis-

orders, most have concentrated on the use of herbal remedies derived from medicinal plants, homeopathy, acupuncture, and Ayurvedic interventions. Ayurveda, a medical tradition originating from India, has had the least amount of published research. In its truest form Ayurveda exists for the promotion of health rather than the prevention of specific disease states that have already begun to affect the body.

One study in California focusing on patients with the diagnosis of asthma or rhinosinusitis revealed that 42% of all patients surveyed had used CAM interventions; 24% of all patients had used herbs; and 42% of the herb users used ephedra-containing products. The majority (>75%) of all patients were college educated, but no statistically significant link was found between level of education and the use of CAM interventions. Considering issues of health disparities, Hispanic patients and those with incomes less than \$20,000 annually were less likely to have used CAM interventions. Women were found to be more likely to have used homeopathy, acupuncture, and massage; younger age was associated with medicinal caffeine use. Finally, self-assessed disease severity did not have an impact on herb use, but homeopathy was used by patients who felt they had a more severe disease (2). This data re-emphasizes the importance of discussing CAM interventions with all patients.

### **Examples of Modalities Commonly Used for Asthma**

There are a wide variety of herbs used in the treatment of asthma. Particularly common is the use of Ma Huang, a traditional Chinese medicine, the main active ingredient of which is ephedrine. Although an established asthma treatment, theophylline is found in tea leaves, regular black tea and coffee have also been used for the therapeutic effects of their methylxanthine component, caffeine, in the treatment of asthma (2). In a study of 601 adult asthmatics

comparing the use of CAM agents, 8% reported the use of herbal remedies and 37% of herb users used ephedrine-containing products. 6% of all patients used ephedrine alone and 6% used coffee or black tea. This study found that while coffee, black tea, or other herb use was associated with an increased risk of ER visits and hospitalization related to asthma, the ephedrine-containing herbs and ephedrine supplementation were not (13). These agents did have cardiac and neurological adverse effects.

Traditional Chinese medicine remedies often involve the use of several herbs, but they most commonly include Ma Huang (ephedra). *Ginkgo biloba* has been used and although the mechanism of efficacy is often questioned, several platelet activating factor antagonist effects have been identified. Licorice has been used for its anti-inflammatory properties while various other herbs have anticholinergic actions such as the smoke of henbane leaves and stramonium cigarettes (10).

Herbal combinations used in traditional Japanese medicine are similar to those in traditional Chinese medicine and include ephedra, licorice, asarum, schisandra, peony, poria, scute, Chinese date, bupleurum, perilla, pinellia, ginseng, and magnolia. Combinations of these agents are commonly known as saibuko-to/Sho-saiko-to. Some of these agents have been shown to have a downregulating effect on lipooxygenase and cyclooxygenase activity (10). There have been numerous citations of the adverse effects including hepatotoxicity and pneumonitis regarding these agents (10,14).

Other common plants that are known to have active ingredients include the Ayurvedic *datura* plants as a source of atropine and *Coleus forskohlii* plants that produce a  $\beta$ -sympathomimetic effect. Mucokinetic drugs used in Europe include mustard and horseradish. The North American-derived *echinacea* has been used for the prevention and treatment of common cold. However, there have been recent reports of complications of the use of *Echinacea*

including anaphylaxis, bronchospasm, urticaria, and angioedema that are more commonly reported in individuals with atopy (10,15).

Acupuncture is a form of traditional Chinese medicine that works on the principle of redistribution of Qi, the life energy. In traditional Chinese medicine, it is believed that an imbalance of Qi or poor flow of Qi is the origin of disease. By placing needles at specific points along meridians, Qi is able to redirect one's energy flow into better balance. The NIH Consensus Development Panel within the National Center for Complementary and Alternative Medicine (NCCAM) has been working on supporting studies that provide the scientific integrity to either support or disavow the efficacy of acupuncture in the treatment of specific conditions, including nausea, pain, and addictions (16). Acupuncture in the treatment of asthma is uncommon although there are case reports of mechanical side effects from the needles including contact dermatitis and pneumothorax.

### Examples of Modalities Commonly Used for Allergic Disease

Herbs, homeopathy, and acupuncture have all been used successfully by patients in the treatment of allergic disease including allergic dermatitis, rhinitis, and conjunctivitis.

Many studies of herbs in the treatment of allergic disease can be found; the following are examples of herbal remedies for rhinitis, dermatitis, and conjunctivitis. Butterbur, a petasine (*Petasites hybridus*), is a herbaceous plant native to Europe, Northern Africa, and Southwest Asia in the Petasine family. The petasines have been shown in vitro to cause their effects by the inhibition of leukotriene synthesis, inhibition of histamine binding to H1 receptors and blockage of degranulation of inflammatory cells. In a randomized double-blind parallel group comparison study, the effects of Butterbur were compared with the effects of commonly used oral antihistamine, cetirizine.

The 125 study participants scored their allergic symptoms; global functioning was assessed by questionnaire. The "overall" outcome was that Butterbur's effects compared to cetirizine were similar. Symptom-specific outcomes were not individually evaluated. It was noted that there was no pattern of side effects noted with Butterbur, while drowsiness was noted with cetirizine (17). Honey has been anecdotally reported to modulate the allergic response of seasonal allergy sufferers. In a randomized double-blind placebo-controlled study comparing the effects of pasteurized honey, unpasteurized honey, and placebo, 36 subjects ingested 1 tablespoon of honey per day for 195 d during peak allergy seasons (May–August). The patients rated the severity of the following symptoms: sore eyes, swollen eyes, watery eyes, itchy eyes, headache, runny nose, sneezing, itchy nose, post-nasal drip, and stuffy blocked nose. No change in symptoms was noted consistently when honey users were compared to the placebo-controlled group (18). Eight weeks of daily treatment with a Chinese herbal remedy (extract of 18 herbs) reduced the severity of nasal symptoms and non-nasal symptoms and improved measures of quality of life in a randomized, double-blind, placebo-controlled study of 55 patients with seasonal allergic rhinitis seen in a Chinese medicine clinic in Australia (19).

One of the first studies of herbal therapy in atopic dermatitis involved 47 children with severe eczema treated with Zemaphyte™ (active ingredients *Ledebouriella seseloides*, *Potentilla chinensis*, *Anebia clematidis*, *Rehmannia glutinosa*, *Paeonia lactiflora*, *Lophatherum gracile*, *Dictamnus dasycarpus*, *Tribulus terrestris*, *Glycyrrhiza uralensis*, and *Schizonepeta tenuifolia*). After an 8-wk treatment period, the study group demonstrated a 91% decrease in erythema compared to 10% decrease observed in the placebo group. A similar study was conducted in adults with similar results. These herbs have been theorized to work by several mechanisms, including: stimulation of the adrenal cortex leading

to increased endogenous cortisone and cortisol release; potentiation of endogenous corticosteroids by slowing metabolic degradation; corticosteroid activity of the plants themselves; decreased production of inflammatory compounds (leukotrienes, prostaglandins, and arachidonic acid); antipruritic effects (possibly via vasoconstriction); and antibacterial action (20). More recently, 2 wk of topical treatment with a licorice extract gel (made with 2% licorice extract; 19.6% glycyrrhizinic acid in gel) reduced erythema, edema, and itching in a double-blind study of 60 patients with atopic dermatitis (21).

Euphrasia drops (from the *Euphrasia rostkoviana officinalis*) were studied in a prospective cohort trial for their efficacy in the symptomatic treatment of conjunctivitis of any etiology (allergic, irritative, infectious). Eighty patients were enrolled in the study and 65 patients completed the study in which patients used were permitted to use one drop of Euphrasia eye drops up to five times daily as needed for symptoms: reddening, burning, and veiling of vision. At the conclusion of the study it was reported that more than 95% of patients experienced a complete disappearance of their symptoms within 3–17 d of starting the Euphrasia drops, with optimal results from the administration of one drop three times a day (22).

Acupuncture has also been studied in the treatment of allergic rhinitis. In a small randomized, controlled study ( $n = 30$ ) of patients suffering from seasonal allergic rhinitis, efficacy of treatment with acupuncture was assessed. The group was divided into two and treated with acupuncture or a sham control, each performed three times a week for 4 wk. After the initial 4 wk, the groups were crossed so that the original placebo group became the treatment group and vice versa. In both cases, the subjects treated with acupuncture, when compared to a control group receiving sham acupuncture, had a 70% relief of their non-nasal (itching eyes and eye watering) and nasal

seasonal allergy symptoms. The sham control group had a 30% relief of their symptoms. No antihistamines were used by the participants, although they were available if the individual were to have deemed them necessary (23).

One of the primary tenets of homeopathy is the principle of treatment with agents that cause effects similar to the disease state. The remedies prescribed by homeopathic practitioners are essentially very dilute solutions of drugs known to cause the very symptoms which are to be treated. According to the literature reviewed, 3–4% of CAM users use homeopathy, and about 75% of patients seen by a homeopathic practitioners report symptomatic improvement. Homeopathic remedies are determined by “provings” and are listed in the *Homeopathic Materia Medica* (24). In a study designed to determine if homeopathy was primarily a placebo response, a 30c (1 part in  $10^{60}$ ) solution of grass pollen extract was given to 70 patients and a placebo remedy was given to an additional 70 patients. When patient’s symptoms scores (based on symptoms of sneezing, blocked and runny nose and watery, red, irritated eyes) were compared between the two groups, there was a significant improvement in the homeopathically treated group. However, some members of this group also suffered from exacerbation of their symptoms, leaving the author of the study to recommend that homeopathy may be more useful as a preventative measure than for acute symptomatic relief (25). In a retrospective study assessing systemic medication use in allergy sufferers, those patients who had used homeopathy in addition to traditional medication for allergy had an average reduction in their use of antihistamines by 70% due to symptomatic relief from homeopathy remedy use (26).

## Risks of Complementary and Alternative Medicine

Risks associated with CAM interventions include direct toxicities of the therapies them-

selves, the lack of conventionally tested medical interventions, and the liability risk for physicians who provide or counsel patients in the use of complementary and alternative medicines.

## Direct Physical Risks Associated With CAM Interventions

The majority of adverse effects reported have been associated with herbal formulations similar to the risks associated with conventional pharmaceutical agents and have included hepatic and renal toxicities and hypersensitivity reactions (see summary Table 1). Hepatotoxicity has previously been reported with Kinshi-gan and Sho-saiko-to. Both formulations contain *Ginseng Radix*, *Scutellariae Radix*, and *Glycyrrhizae Radix*. Liver injuries generally peaked with 3–4 d of challenge and resolved within 2 wk; challenge testing may induce severe allergic reactions in addition to hepatic injury, particularly in patients with known allergic disease. However, more serious adverse effects have also been reported such as fatal cases of liver failure associated with restarting Kinshi-gan and Sho-saiko-to (14) and acute pneumonitis with Sho-saiko-to (10).

Renal toxicity examples include hypokalemia, water retention, and sodium retention associated with licorice ingestion and nephrolithiasis associated with ephedra (10,20). The widely used ephedra has also been linked with severe cardiovascular and neurological side effects, including 10 fatalities (1). Ephedra has recently come under even more scrutiny for its use in diet and performance enhancement. In the doses required to effect weight loss, side effects are commonly observed. California banned the distribution and sale of ephedra alkaloid-containing products effective January 1, 2004. Under the new state law, licensed health care practitioners may prescribe or dispense ephedra-containing products only for purposes other than weight loss, body building, or athletic performance enhancement (27).

As with any unregulated substance, one must also be concerned about the amount of pharmacologically active drug in any given preparation and any contaminants (5,10). Traditional Chinese medications have been linked with both dosage toxicities and contamination (1). Many of the remedies may be safe at low doses, but at higher doses become markedly toxic. However, without studies to establish the therapeutic index, it is difficult if not impossible to advise patients on the use of CAM interventions. Contaminants that have been found range from NSAIDs, steroids, and benzodiazepines to heavy metals (e.g., lead) (5,6,10,21) (see summary Table 2). The wealth of misleading and poorly obtained scientific evidence is dangerous for patients who expect “natural” CAMs to be naturally safe.

Aside from CAM modalities taken for the control of asthma or allergic disease, physicians must also remember to ask about remedies taken for other conditions. As noted earlier, echinacea is often taken as prophylaxis for the common cold. It has been associated with anaphylaxis, bronchospasm, urticaria, angioedema, hepatitis, hypertension, atrial fibrillation, acute renal failure, and vasculitis (15). One case report describes a middle-aged woman who developed anaphylaxis within a few minutes of ingesting a solution of echinacea. She had been taking the supplement for several years prior to the event without incident; she had a history of atopy; oral allergy syndrome and urticaria/angioedema associated with bananas. After the incident, allergy was confirmed with skin prick and intradermal testing to the same solution the patient had ingested. Findings were further confirmed by RAST. Further investigation of other patients in the practice found that even among those who had not been using echinacea, but were sensitive to grass pollen, 94% had positive immediate skin tests to echinacea. As such, patients with atopy may be at higher risk than the general population of developing serious adverse reactions to herbal modalities (28).

Table 1  
Herbs in Allergy and Asthma-Mechanisms of Action/Symptoms Treated  
and Observed Adverse Effects (5–7,13)

| Herb                                                      | Mechanism of action/symptom treated                                                                                                                                                             | Adverse effect                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Allium cepa</i> (onion)                                | Inhibits mast-cell degranulation                                                                                                                                                                | Strong odor                                                                                                                                                                                                                                                                                                   |
| <i>Aloe arborrescens</i>                                  | Bronchodilation                                                                                                                                                                                 | Electrolyte imbalances, abdominal cramps, <i>pseudomelanosis coli</i>                                                                                                                                                                                                                                         |
| <i>Atropa belladonna</i>                                  | Anticholinergic and bronchodilating properties                                                                                                                                                  | Ataxia, hallucinations, extrapyramidal reactions, decreased bowel sounds, photophobia, sinus tachycardia, thirst and urinary retention                                                                                                                                                                        |
| <i>Bu-zhong-yi-qi-tang</i> (traditional Chinese medicine) | Decreased capillary permeability; decreased eosinophils, CD4 cells, IL-4 and IL-5; inhibited Th2-cell responses                                                                                 | None reported                                                                                                                                                                                                                                                                                                 |
| Caffeine                                                  | Bronchodilator                                                                                                                                                                                  | Insomnia, GERD, hypertension                                                                                                                                                                                                                                                                                  |
| <i>Coleus Forskohlii</i>                                  | Bronchodilator; possibly due to intracellular stimulation of adenylate cyclase to produce cAMP; high doses required to produce effect                                                           | Tremor and hypokalemia, although proportionally less than effect of $\beta$ -agonist in study                                                                                                                                                                                                                 |
| <i>Datura stramonium</i> (Jimsonweed)                     | Tropane alkaloids (atropine, hyoscyamine, hyocine, scopolamine); bronchodilator                                                                                                                 | Ataxia, hallucinations, extrapyramidal reactions, decreased bowel sounds, photophobia, sinus tachycardia, thirst and urinary retention                                                                                                                                                                        |
| <i>Echinacea</i>                                          | In vitro antiviral effects vs influenza; reduction in number of URIs in randomized trial                                                                                                        | Anaphylaxis, bronchospasm, urticaria, angioedema, hepatitis, hypertension, a-fib, acute renal failure, and vasculitis                                                                                                                                                                                         |
| <i>Eucalyptus</i>                                         | Cold/influenza remedy; mucokinetic/decongestant; cockroach repellent                                                                                                                            | Allergic reactions                                                                                                                                                                                                                                                                                            |
| <i>Ghamazulene</i> (chamomile)                            | Leukotriene inhibitor                                                                                                                                                                           | Rarely, anaphylaxis in patients allergic to ragweed/chrysanthemum; botulism                                                                                                                                                                                                                                   |
| <i>Golden seal</i> (hydrazine)                            | Treatment of upper respiratory infection, diarrhea, conjunctivitis, acute otitis media, eczema                                                                                                  | Peripheral vaso-constriction/hypertension; irritation of the oropharynx; nausea, vomiting, diarrhea                                                                                                                                                                                                           |
| <i>Hi Chun</i> (Korean)                                   | Stabilizes mast-cell membrane; inhibits histamine release                                                                                                                                       | None reported                                                                                                                                                                                                                                                                                                 |
| <i>Jisil</i> (Korean)                                     | Stabilizes mast-cell membrane; inhibits cAMP and decreased IgE production                                                                                                                       | None reported                                                                                                                                                                                                                                                                                                 |
| <i>Kutki/Kurro</i> (Indian Ayurvedic)                     | Stabilizes mast-cell membrane                                                                                                                                                                   | None reported                                                                                                                                                                                                                                                                                                 |
| <i>Licorice</i>                                           | Slows the change of cortisol to cortisone, blocks histamine induced capillary permeability, inhibits PAF and has antitussive activities                                                         | Hypokalemia                                                                                                                                                                                                                                                                                                   |
| <i>Ma Huang</i> (Ephedra)<br><i>Wu-Hu-Tang</i>            | Oral adrenergic agonist, it inhibits mast-cell degranulation and has sympathomimetic activity; for treatment of asthma/allergic rhinitis doses are usually 15, 25, or 30 mg three times per day | Concern of safety when used in high doses, particularly for weight loss (100 mg twice a day); common side effects include hypertension, tachycardia, palpitations, nervousness, headache, insomnia, dizziness, euphoria, nephrolithiasis, seizure, stroke, and myocardial infarction; has caused sudden death |

Table 1  
(Continued)

| Herb                                                         | Mechanism of action/symptom treated                                                                                                                                                                                          | Adverse effect                                                                                             |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Menthol (mint)                                               | Decongestant action                                                                                                                                                                                                          | Ingestion may be fatal (mechanism of death not reported)                                                   |
| Minor Blue Dragon                                            | Stabilizes mast-cell membranes                                                                                                                                                                                               | None reported                                                                                              |
| Peppermint oil (mint)                                        | Decongestant action/stabilizes mast-cell membranes                                                                                                                                                                           | Cardiac arrhythmias                                                                                        |
| <i>Sho-seiry-to</i> (Japanese)                               | Decreased IgE-mediated cutaneous reactions; complement inhibition; anti-cholinergic effect leads to drying of secretions and decreased inflammation                                                                          | None reported                                                                                              |
| <i>Urticaria dioica</i> (Nettle)                             | Stem nettles contain histamine, serotonin, choline; used in the treatment of allergic rhinitis                                                                                                                               | Contact urticaria with natural plant leaves; diarrhea; gastric irritation; edema; decreased urinary volume |
| <i>Tylophora indica</i> (India)                              | Alkaloid derivative plant which acts as a bronchodilator; induced PEF improvement in one study                                                                                                                               | Nausea, vomiting and sore mouth; worse when plant is chewed                                                |
| <i>Saiboku-to</i> (Japanese)<br><i>Chaipo-tang</i> (Chinese) | Inhibition of 11- $\beta$ -dehydrogenase leads to increased endogenous cortisol levels; in studies, patients dropped their steroid doses; did not induce downregulation of glucocorticoid or $\beta$ -2-adrenergic receptors | Pneumonia/pneumonitis                                                                                      |
| <i>Sho-seiry-to</i> (Japanese)                               | Decreased IgE-mediated cutaneous reactions; complement inhibition; anti-cholinergic effect leads to drying of secretions and decreased inflammation                                                                          | None reported                                                                                              |

Table 2  
Adverse Effects Reported From Contaminants  
of Herbs and Homeopathic Remedies

| Contaminant | Number of reports | Adverse effect noted  |
|-------------|-------------------|-----------------------|
| Mercury     | 4                 | Motor and vocal tics  |
| Lead        | 111               | Anemia/encephalopathy |
| Steroids    | 2                 | None                  |
| Arsenic     | 75                |                       |

Green tea has been shown to have antioxidant, antibacterial, antiviral activity, and it is taken by many patients as a preventative measure. In one case report, 11 patients developed occupational asthma associated with the inhalation of green tea dust; 5 of the 11 had symptoms after drinking green tea as well. The allergen

association was confirmed with intradermal tests and challenge inhalation (29). Another commonly used herb, ginseng, has also been associated with adverse effects. Ginseng is often used for weakness and fatigue, additionally it is thought to have efficacy in boosting immune system function. Adverse effects reported include nausea, diarrhea, euphoria, insomnia, headaches, hypertension, hypotension, mastalgia, and vaginal bleeding. Due to liver effects it may lower blood alcohol concentration and decrease warfarin efficacy. Interactions with caffeine may lead to hypertension. Ginseng may lead to hypoglycemic episodes in patients taking insulin or oral hypoglycemic agents. It is contraindicated in hypertension, acute asthma, acute nose bleeds, acute infections, or menorrhagia (30).

Table 3  
Acupuncture and Other Physical Modalities:  
Observed Adverse Effects (5,6,10)

| Modality            | Sample size | Adverse effect       |
|---------------------|-------------|----------------------|
| Acupuncture         | ??          | Hepatitis B          |
| Acupuncture         | 1           | Cardiac tamponade    |
| Acupuncture         | 1           | Septic sacroiliitis  |
| Acupuncture         | 1           | Septic arthritis     |
| Acupuncture         | 1           | HIV                  |
| Acupuncture         | 1           | Pneumothorax         |
| Spinal manipulation | ??          | CVA                  |
| Spinal manipulation | 1           | Holocord astrocytoma |
| Massage             | 1           | Large hematoma       |
| Cupping             | 1           | Sepsis               |

There have also been adverse effects reported with acupuncture (*see* summary Table 3). Side effects reported include: vasovagal effects, ear aches, gastrointestinal complaints, five reports of pneumothorax, one case of cardiac tamponade, and one documented case of Hepatitis B among others (10).

### Risks Associated With Lack of Traditional Medicine Involvement

Traditional physicians are not needed to refer patients for complementary/alternative modalities. As such, traditional therapies may be delayed or omitted for these patients (6). In one study of adherence to allopathic treatment amongst asthmatics in India, CAM intervention, particularly yoga, ayurveda, and homeopathy were seen as barriers to achieving adherence with  $\beta$ -agonist or other traditional interventions (31). Twenty-six percent of individuals using CAM interventions were not concomitantly using traditional treatment for asthma/rhinitis (2) and there is concern that the use of CAM interventions may delay use of specific anti-inflammatory therapy leading to increased ER visits or hospitalizations (32). Additionally, some patients may be swayed by CAM practitioners regarding immunization. Only 30% of chiropractors, homeopaths, and

naturopaths recommend immunization, while 7% of American naturopaths actively oppose immunization.

### Liability Risk for Physicians

Some patients may seek the advice or referral from their physician before seeing the care of a CAM provider. This discussion is more likely when CAM use has been discussed in the past, so that the patient feels comfortable discussing alternative treatment options with the primary physician. In this role, it must be remembered that the physician is still responsible for the coordination of overall care of the patient. Physician liability may stem from recommendations to pursue CAM interventions or from failing to actively discourage the use of certain CAM interventions.

There are essentially four categories under which the risks fall (from low to high):

1. Evidence supports both efficacy and safety (e.g., acupuncture for chemotherapy-induced nausea).
2. Evidence supports safety, but evidence regarding efficacy is inconclusive (e.g., homeopathy for rhinitis).
3. Evidence supports efficacy, but evidence regarding safety is inconclusive (e.g., Ginkgo for dementia).
4. Evidence indicates serious risk or inefficacy (e.g., injections of unapproved substances; inattention to known herb-drug interactions).

The liability risk associated with a particular modality increases as less is known about positive efficacy or safety. In determining the category a particular CAM intervention falls within, the physician must document the literature supporting a particular therapeutic choice; document that the risks and benefits of a given CAM intervention were discussed with a patient and if possible the patient should sign documentation of their assumption of risk. This is particularly advisable if the patient will be replacing traditional treatment with CAM

interventions. One method of dividing modalities into risk groups for patients uses three categories: sufficient evidence to view the therapy as reasonable and sometimes recommend; reasonable with caveats; clearly unwise. These categories were originally developed for the use of oncologists when discussing treatment options with their patients (33), but can be effectively used for any patient considering CAM interventions. When referring a patient, it is also prudent to confirm the competency/certification of the practitioner to whom your patient is referred (34).

## Conclusions

CAM interventions are continuing to grow in popularity among patients in the United States and abroad for the treatment of a myriad of conditions. Asthma and allergic disease are among the conditions most commonly treated with CAM. These modalities may offer exciting opportunities for patients who respond poorly to or have difficulty tolerating traditional treatment, but it is advisable to discourage patients from abandoning conventional therapy completely.

Herbs are among the CAM modalities most commonly used, and unfortunately also appear to most commonly cause adverse effects. Adverse effects associated with CAM use may be due to toxicity of the intervention itself or contaminants of the intervention. For these reasons, and because atopic patients may be more susceptible to adverse reactions from these modalities, it is important that allergists and clinical immunologist be well-versed in the benefits and risk associated with CAM use. Since patients may not volunteer their experiences with CAM interventions, physicians must routinely screen all patients. Furthermore, well designed, randomized, and placebo-controlled studies are needed to clearly establish the efficacy and safety of these modalities so that patients and physicians can

reasonably establish the risk-benefit ratio associated with various modalities.

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