Botanical Strategies for Cardiovascular Support

Beverly Yates, ND

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Introduction

Practitioners in the world of natural medicine who use holistic, integrative approaches may think they can't help people with serious or moderate cardiovascular problems because they are not experienced in working with those patients. However, if practitioners don't provide specific support to their patients with ailing cardiovascular systems, those patients face increased risk of heart attacks, strokes, continued buildup of artery-clogging plaque, and further decay of their blood vessels. As patients get sicker, the number of pharmaceutical drugs prescribed for them will increase.

Practitioners can help such patients avoid these negative outcomes, sometimes with simple measures. In this paper, Dr. Beverly Yates reviews treatment options with botanical agents. This paper outlines:

- Common cardiovascular problems
- The consequences of inaction
- Which patients may benefit from botanical interventions
- The science behind these botanical agents for cardiovascular healing, and their clinical applications:
  - Hawthorn (crataegus)
  - Turmeric and curcumin (curcuma longa)
  - Ginkgo (ginkgo biloba)

Common cardiovascular problems

Inflammation is problematic for many body systems, including the cardiovascular system. Inflammation makes cholesterol "sticky," which can lead to negative cardiovascular events. In the heart tissue itself, the energy of the cardiac cell tissue can be compromised. If the cardiac cellular level is compromised, then the function of the heart and the blood vessels around the body will also be affected.

Cardiac rhythm disorders are rampant, and the causes can be difficult to ascertain. These disorders are not all readily explained by hormonal changes, stress, or other events that might seem to be a contributing factor to cardiac rhythm disorders. Additionally, cardiac blood flow (blood flow to the heart itself) and systemic blood flow (blood flow all over the body) can both be compromised.

Consequences of inaction

What happens if a practitioner fails to act?

Practitioners in the world of natural medicine who use holistic or integrative approaches sometimes say: "I don't see a lot of heart disease patients," or, "I don't feel comfortable treating them and am not sure I would know how." Without specific support to an ailing cardiovascular system, the patient who sought out a practitioner's care is at increased risk for such outcomes as myocardial infarction, ischemic stroke, buildup of artery-clogging plaque, further deterioration of the vasculature, and exposure to an increased number of medications and their potential side effects.

Consequences of unchecked inflammation

While many people believe cholesterol alone is an issue, the real problem is underlying inflammation. As was noted above, inflammation causes cholesterol to become "sticky", increasing the probability of building up artery-clogging plaque. The reasonable sequelae of unchecked inflammation include atherosclerosis, arteriosclerosis and peripheral venous disease, also known as intermittent claudication. Inflammation can also have a negative impact on the immune system and lead to neurotransmitter imbalances.

The most likely sign of chronic inflammation may be up regulation of inflammatory markers. Sometimes the patient presents in the early stages with a few inflammatory markers elevated, but additional markers can become elevated over time. Helping the patient reduce inflammation on a few markers can positively affect others.

Consequences of cardiac cellular compromise

With cardiac cellular compromise, the heart tissue is exhausted at the fundamental cellular level. The heart's primary role of pumping and circulating blood around the body — removing deoxygenated blood from the blood stream and resupplying it with freshly re-oxygenated blood — is compromised.

Pharmaceutical treatments can sometimes deplete the heart of the nutrients it needs to stay strong. For example, statins deplete the cardiac tissue of coenzyme Q10, along with other nutrients, which can compromise the heart.

A compromised heart can negatively affect daily living. Everyday activities can become difficult, particularly for patients who have conditions such as atrial fibrillation, congestive heart failure, and, to some degree, mitral valve prolapse. This condition can also have a psychological impact. Patients worried about their hearts can become fearful and further limit their physical activities.

Consequences of cardiac rhythm disorders

For patients with cardiac rhythm disorders (heartbeat irregularity), fear can be magnified. Patients who have atrial fibrillation, ventricular fibrillation, and other types of disorders or dysrhythmias of the heart can become frightened and challenging to treat. Frightened patients can sometimes be noncompliant. For example, they may exceed dosage guidelines, believing more is better, or refuse to do what is advised, worsening their condition.

In terms of differential diagnosis, practitioners should be aware that a variety of factors can lead to cardiac rhythm disorders. For example, some women develop temporary rhythm disorders as they enter menopause. Hyperthyroid conditions can also be associated with heart dysrhythmias. Anxiety disorders, such as panic attacks, can lead to heartbeat irregularities. Arrhythmias can also be a prominent side effect of certain medications.

However, practitioners should not dismiss a real risk of cardiovascular disease as a case of anxiety or depression —as can often happen with female patients. If there is a concern of undiagnosed cardiovascular disease, it is prudent to work with a cardiologist and make sure a thorough evaluation is completed.

Never dismiss a patient expressing fear about heart rhythm problems; a heartbeat irregularity that continues for an extended period of time can lead to death.

Cardiac and systemic blood flow compromise

Blood flow compromise in heart tissue, when the heart itself isn't getting enough blood, classically leads to myocardial infarction, which can be mild, moderate, or severe. In heart attack survivors, what is left of the functional heart tissue must work harder to compensate for the affected heart tissue.

Gender influences the way a body compensates for compromised heart blood flow. Women tend to form extra blood vessels and compensate for weakened areas in the heart often "bypassing" the heart attack or minimizing it. Women are also more likely to have smaller blood vessels of the heart, but many more microvasculature. Men are much more likely to have large blood vessels and not as many small micro-vessels.

When systemic blood flow (blood flow throughout the body) is compromised, and there's not enough tissue perfusion — particularly in the periphery — tissue damage or desensitization may result. Areas of the body at risk for damage from inadequate tissue perfusion include fingers, toes, nose, the clitoris, penis, and ears.

Insufficient tissue perfusion in the brain can lead to problems with dementia via a syndrome called cerebral insufficiency. Diabetes also can accelerate systemic blood flow compromise because of its inflammatory profile.

A simple test can provide a quick assessment of peripheral blood flow compromise. To perform the test, press on a patient's fingertips or palms and then release. Failure of the blood flow to immediately return indicates possible compromise.

Patients who may benefit from botanical interventions

In general, patients who do not respond well to pharmaceutical interventions — they experience significant side effects and realize minimal benefits — tend to do well with botanical interventions for cardiovascular healing.

Patients who want to preserve their current level of cardiovascular function are also good candidates for using botanical agents, even if they are quite ill. Additionally, those who want to maximize their cardiovascular function can benefit from botanicals.

Botanical partners for cardiovascular healing

Hawthorn (crataegus)

A number of hawthorn (crataegus) species have been found to be beneficial for healing. Those most commonly used with a strong evidence base in the research literature are Crataegus oxyacantha, monogyna, laevigata and pentagyna. Hawthorn promotes improved cardiac function, strengthens the heart tissue, and promotes vascular and cellular stability. Hawthorn also has anti-inflammatory properties, including strong antioxidant activity. It promotes a "friendly" cholesterol profile, increasing HDL while lowering LDL, and decreasing the "stickiness" of cholesterol. Hawthorn also helps decrease triglycerides, and improve the recovery of blood vessels from prior oxidative damage, from such causes as smoking or stress. It also helps improve atherosclerotic lesions.

A number of large human clinical trials have demonstrated the safety and efficacy of the hawthorn leaf and flower for Class I and Class II mild congestive heart failure, as defined by the New York Heart Association, and hawthorn has been widely used in Europe for treating Class I-II heart failure, with preparations based on its flavonoid content.

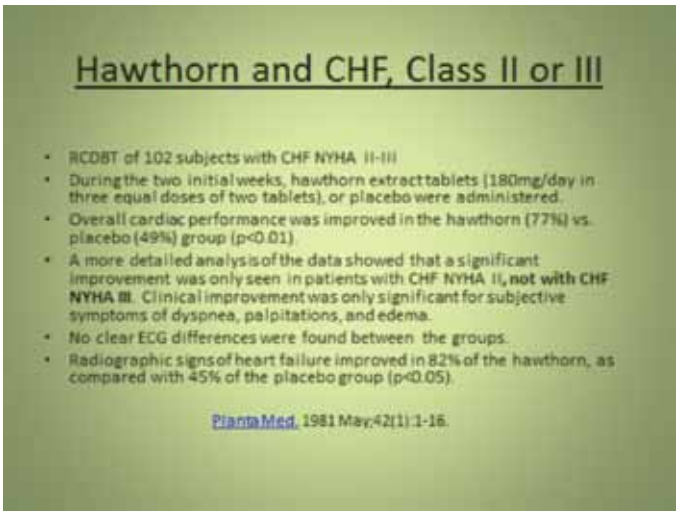
The therapeutic equivalence of hawthorn extracts to drugs that are considered standard-of-care for heart failure, including angiotensin converting enzyme (ACE) inhibitors, diuretics and beta-adrenergic receptor blockers, remains to be established, along with further study of the effect of concomitant use of hawthorn with these drugs. Nonetheless, hawthorn appears to be safe and well-tolerated and is a potentially beneficial therapy for patients who cannot or will not take prescription drugs, and may offer additive benefits—with monitoring—to prescription drug therapy.

Hawthorn can increase the efficiency of the cardiovascular system so much that a patient may not require as much prescription medication, something the patient and other health professionals treating the patient should be made aware of.

Hawthorn and CHF

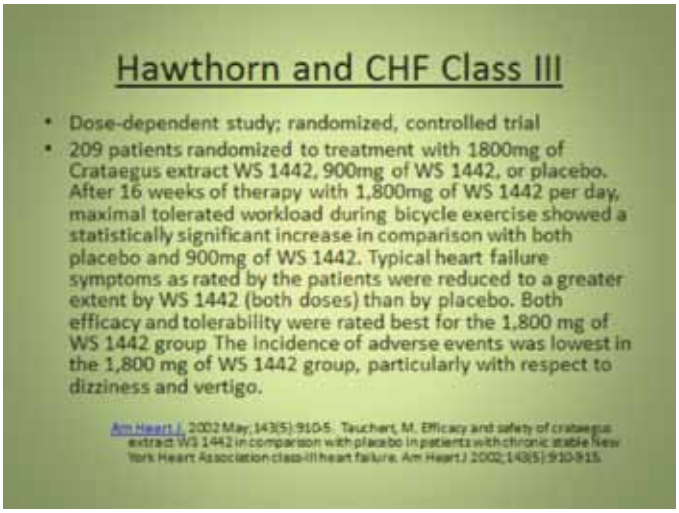
A research study in the Drug Safety Journal looked at mono-preparations of hawthorn for Class I or Class II congestive heart failure. The study involved standardized 18.75% oligomeric procyanidins and 2.25% flavonoids.[1]

A study in Planta Medica was a randomized, double-blind, controlled trial of 102 subjects with moderate congestive heart failure, New York Heart Association Class II and Class III. During the initial two weeks, hawthorn extract tablets — at 180 mg/ day in three equal doses of two tablets — or a placebo were administered. The overall cardiac performance was improved in the hawthorn versus the placebo group, with almost a 25% difference. A more detailed analysis of the data showed that a significant improvement was only seen in the patients with congestive heart failure Class II, not Class III. Clinical improvement was only significant for subjective symptoms of dyspnea, palpitations, and edema. There were no clear echocardiogram differences found between the two groups, and radiographic signs of heart failure improved in 82% of the hawthorn users as compared with 45% of the placebo group, a significant difference.



[1] Drug Saf. 2006;29(6):523-35. "Hawthorn monopreparations standardized to 18.75% oligomeric procyanidins and 2.25% flavonoids."

In a dose-dependent hawthorn study, a randomized and controlled trial of 209 patients with Class III congestive heart failure, participants took either 1,800 mg of crataegus extract, 900 mg or a placebo. After 16 weeks of therapy with 1,800 mg per day, the maximal tolerated workload during bicycle exercise showed a statistically significant increase in comparison with both the placebo and the 900 mg dose. Typical heart failure symptoms, as rated by the patient, were reduced to a greater extent for doses of either 1,800 mg or 900 mg of hawthorn than they were by placebo. It appears that the placebo patients did not perceive the kinds of benefit perceived by those taking crataegus. Both efficacy and tolerability were rated highest by the 1,800 mg group. The incidence of adverse events was lowest in the 1,800 mg group, particularly with respect to dizziness and vertigo. The study's results suggest that perhaps 900 mg wasn't quite enough for a Class III congestive heart failure patient and that giving them twice as much (1,800 mg) was more beneficial.



Hawthorn and cholesterol

In the case of hypercholesterolemia, hawthorn is very beneficial. It helps increase the binding of LDL to liver plasma membranes, removing it from circulation. Hawthorn increases bile acid excretion and decreases the liver's cholesterol synthesis.

To some degree, hawthorn depresses hepatic cholesterol synthesis. If a patient with normal cholesterol taking hawthorn becomes hypocholesterolemic, it is likely an effect of hawthorn, via an up regulation of the hepatic LDL receptors. The beneficial outcome is an influx of plasma cholesterol into the liver and less in circulation in the blood vessels.[2]

Hawthorn safety, contraindications and dosing

The dosing ranges suggested for congestive heart failure are: 160 mg to 900 mg of hawthorn extract per day, in two to three divided doses, taken with or without food. For extracts that are standardized 18.75% oligomeric procyanidins, the dosage range is 240 mg to 480 mg per day.

Most hawthorn treatment strategies should continue for at least three months, and patients with congestive heart failure Classes II and III may need treatment for life. Just as patients may have a permanent need for a walker or wheelchair as a physical aid, a compromised heart may need a cardiac aid, and hawthorn might serve that purpose.

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[2] Atherosclerosis. 1996 Jun;123(1-2):235-41.

In the case of high cholesterol, studies have shown 160 mg to 400 mg of hawthorn extract per day in two to three divided doses to be beneficial, and 180 mg to 300 mg a day in divided doses for extracts that have been standardized to 18.75% oligomeric procyanidins.

Taking hawthorn has not been associated with nausea or other adverse gastro-intestinal effects.Only limited adverse effects have been reported in human trials as contraindications for hawthorn. Practitioners should monitor patients who are on anticoagulant and antiplatelet therapy. Based on in vitro study, some of the constituents of hawthorn were found to inhibit thromboxane A2 biosynthesis, which could affect coagulation and platelet function. Using hawthorn along with the classes of drugs that include anticoagulants and antiplatelet agents might increase the risk of bleeding through the inhibition of platelet aggregation.[3] For patients who are hypotensive, hawthorn may be contraindicated because it may increase the hypotensive effect. Patients who are taking antihypertension medications, however, may have additive effects and hawthorn may help them regulate their blood pressure and get it to within a normal range.[4]

Patients taking antilipemic medications may also experience additive effects because of hawthorn's antihypercholesterolemic effects.

Animal studies have shown that hawthorn may cause additive vasodilation and hypotensive effects, so practitioners should be aware of a potential interaction with hawthorn for patients taking beta blockers. Similarly, based on data from animal studies, hawthorn may cause vasodilation when used with calcium channel blockers.

Turmeric and curcumin (curcuma longa)

Another botanical strategy for cardiovascular support is curcumin, which is known for its anti-inflammatory properties. It is a prominent part of the cuisine of India, and other countries in Southern and Southeast Asia, where people do not seem to have a high incidence of inflammatory disease. Many have speculated that this low rate of inflammatory disease is due to the amount of turmeric, ginger, and other helpful food agents, flavorings and spices found in the cuisine of these regions.

Curcumin helps to lower systemic inflammation, which may be caused by such conditions as excessive weight or obesity or Type 2 diabetes. Decreasing systemic and local inflammation is important when treating heart disease, poor circulation and compromised cardiac function since inflammation causes problematic plaque to form, leading to potentially damaging, if not fatal, consequences.

Curcumin inhibits the inflammation of a number of markers, including phospholipase, lipo-oxygenase, cyclo-oxygenase 2, leukotrienes, thromboxane, prostaglandins, nitric oxide (NO), monocyte chemoattractant protein 1 (MCP-1), and tumor necrosis factor, along with interleukin-12.[5]

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[3] Prostaglandins Leukot Essent Fatty Acids. 1994 Apr;50(4):173-5

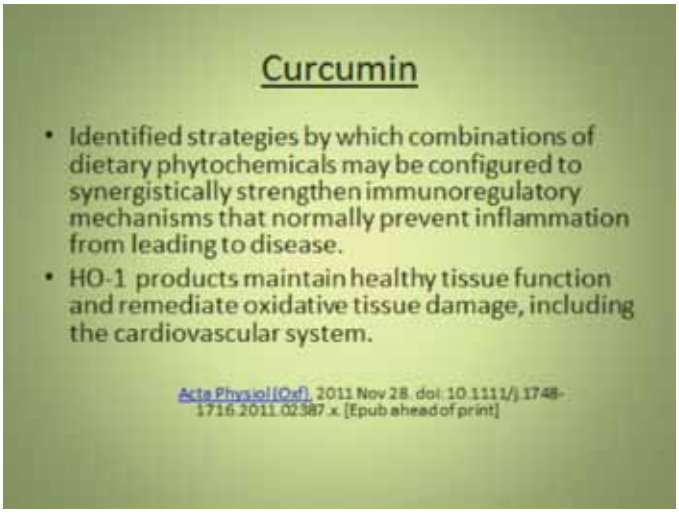
[4] Petkov V. "Plants with hypotensive, antiatheromatous and coronarodilatating action." Am J Chinese Med 1979;7(3):197-236.

[5] J Altern. Complement Med. 2003 Feb;9(1):161-8. "Safety and anti-inflammatory activity of curcumin: a component of tumeric (Curcuma longa)."

Curcumin research

One study on the National Institutes of Health (NIH) website, titled "Curcumin Attenuates Tumor Necrosis Factor ά Induced Expression of Intercellular Adhesion Molecule-1, Vascular Cell Adhesion Molecule-1, and Proinflammatory Cytokines in Human Endometriotic Stromal Cells," discusses the effect of curcumin on inflammation on endometriosis and the female uterus. The study identified strategies by which combinations of dietary phytochemicals can be put together to help to strengthen the immunoregulatory mechanisms that normally prevent inflammation from leading to disease.[6]

A study in the Acta Physiology Journal showed that HO-1 products maintain healthy tissue function and remediate oxidative tissue damage, including damage to the cardiovascular system.



Curcumin safety, contraindications, and dosing

Curcumin is considered safe when used in amounts commonly found in food. It appears to be non-toxic even when used in large amounts. In patients prone to GI distress, there have been reports of epigastric burning and nausea when taken at higher levels — levels the equivalent to eating five to six roots of turmeric — far more than typically consumed in a meal.

Contraindications for curcumin include allergy to turmeric or its constituents, and an allergy to the larger ginger family, Zingiberaceae. Curcumin is also contraindicated in cases of kidney stones, because turmeric has high oxalate content, and in cases of bile duct obstruction, it helps promote bile flow. Similarly, if a patient has gallstones — if they are at risk or have had prior episodes of cholelithiasis — curcumin is contraindicated.

In tea form, 1 gram to 1.5 grams of dried curcumin root can be steeped in 150 mL of water for about 15 minutes and taken twice a day. Patients may take 1.5 mg to 7.5 mg of turmeric daily in three to four divided doses.

A review of the safety and anti-inflammatory action of curcumin noted a lack of toxicity in a phase 1 human trial with 25 subjects using up to 8,000 mg of curcumin per day for up to three months, as well as other studies using from 1,125 mg to 2,500 mg of curcumin daily.[7]

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[6] Phytother Res. 2011 Dec 20. doi: 10.1002/ptr.3694. [Epub ahead of print]

[7] J Altern Complement Med. 2003 Feb;9(1):161-8

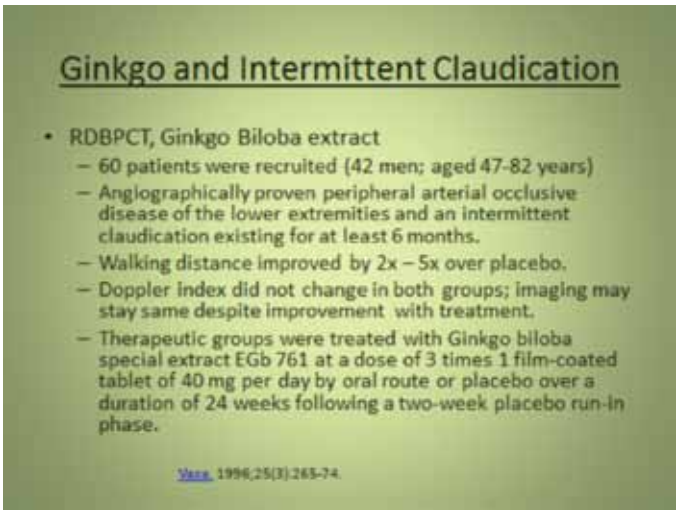
Ginkgo (ginkgo biloba)

Ginkgo is an herb with many different uses, including memory enhancement, but it can also be beneficial in cardiovascular wellness and healing. It has traditionally been used in Chinese medicine as a treatment for conditions such as circulatory disorders, pulmonary diseases, skin lesions (when applied topically) and memory loss. Ginkgo is most commonly used in Europe and the United States for dementia, memory enhancement and claudication. The German expert panel, Commission E, approved Ginkgo for the symptomatic treatment of disturbed performance in organic brain syndrome (memory deficits and disturbances in concentration), and for claudication, vertigo and tinnitus.

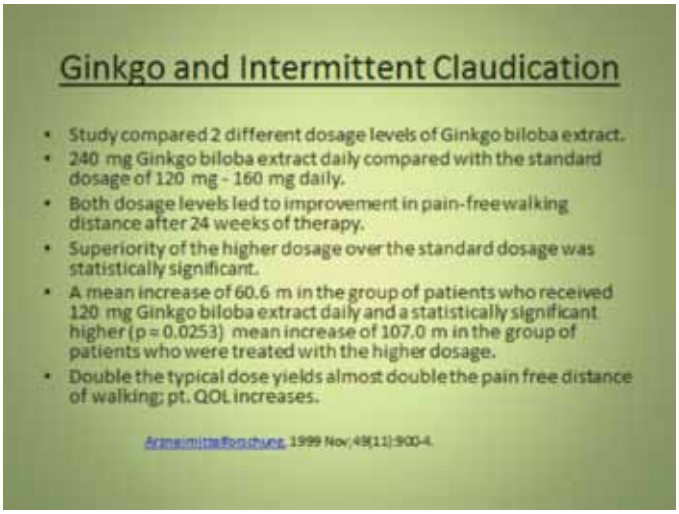
Ginkgo is beneficial in treating vascular diseases, such as peripheral vascular disease, intermittent claudication, Alzheimer's dementia and multi-infarct dementia — caused by multiple, small strokes in the brain. Ginkgo also has an impact on blood vessels, including the peripheral circulation in the brain.

Ginkgo research

A published randomized trial studied ginkgo and intermittent claudication. The study included 42 men, aged 47 to 82. Angiographs proved the participants met the criteria of having peripheral arterial occlusive disease of the lower extremities and intermittent claudication for at least six months prior to the study. The therapeutic groups were treated with ginkgo biloba special extract at a dose of one film-coated tablet of 40 mg three times per day by mouth, or a placebo, for 24 weeks following a two-week placebo run-in phase. The trial found that, for those taking ginkgo, walking distance improved by two to five times over a placebo. The Doppler index did not change in both groups, so imaging may stay the same despite improvement with treatment.



Another study for intermittent claudication compared two different dose levels of ginkgo biloba extract — a dosage of 240 mg was compared to the standard dose of 120 mg to 160 mg. All extract doses were taken daily. Both dosage levels led to improvement in pain-free walking distance after 24 weeks of therapy. Superiority of the higher dosage over the standard dosage was statistically significant. Doubling the dose led to less pain from intermittent claudication for patients.



Some scientists think of cerebral insufficiency syndrome as secondary to atherosclerotic disease. It is characterized by impaired concentration, confusion, decreased physical performance, fatigue, headache, dizziness, depression and anxiety. Patients with congestive heart failure or other cardiovascular diseases often complain of symptoms that may indicate problems specifically in the brain.

Ginkgo was administered for the purposes of trying to address cerebral insufficiency at doses of 120 mg to 160 mg, three divided doses daily by mouth for up to 12 weeks. It was shown to improve concentration and functional status and also reduced headaches, dyspnea, depression, and anxiety. This study suggested that brain perfusion was improved.[8]

Another ginkgo and cerebral insufficiency study consisted of a randomized, double-blind, placebo-controlled trial of 23 weeks' duration, with a computer-based evaluation. It showed a statistically significant improvement in short-term memory and basic learning rates for the test substance group, but not in the placebo group.[9]

Ginkgo safety and contraindications

Ginkgo appears to be generally safe when taken orally by otherwise healthy adults in suggested doses for up to six months. It may be unsafe in children, and patients with a history of seizure, and those with diabetes or those using hypoglycemics, because ginkgo has been found to increase plasma insulin concentrations in healthy volunteers. It was also found to decrease these concentrations in subjects with type 2 diabetes. Ginkgo may also be unsafe in patients using antihypertensive drugs.[10,11,12]

The leaf extract of gingko is most commonly used. The fresh seeds are toxic and potentially deadly, possibly due to their content of 4-methoxypyridine

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[8] Fortschr Med. 1990 Oct 10;108(29):557-60

[9] Fortschr Med. 1992 Feb 20;110(5):73-6

[10] J Clin Pharmacol. 2000 Jun;40(6):647-54

[11] J Clin Pharmacol 2001 Jun;41(6):600-11

[12] Pediatrics. 2002 Feb;109(2):325-7

Ginkgo should be avoided for pregnant patients or those trying to conceive. It should also be avoided for patients with known clotting disorders or those taking anticoagulants. Ginkgo is likely unsafe when administered intravenously.

The handling of ginkgo fruit pulp can lead to severe allergic reactions. Ginkgo may also affect the outcome of electroconvulsive therapy (ECT).

Ginkgo dosage for intermittent claudication or peripheral vascular disease

For intermittent claudication or peripheral vascular disease, the following are dosing suggestions for ginkgo:

- Products containing 24% flavoglycosides — also called flavone glycosides or flavones — and 6% terpene: The range is 80 mg to 240 mg of a 50:1 standardized leaf extract daily, or 3 to 6 mL of a 40 mg/mL liquid extract in two to three divided doses for at least four to six weeks.
- For a tea: 30 mg to 40 mg of extract in the tea bag, prepared as a tea, for at least four to six weeks.

The higher end of the dosing range is warranted in more severe cases. Body weight also should be considering in calculating dosage, and the beneficial effects may take a month or longer.

Ginkgo dosage for dementia

In the case of dementia, doses for ginkgo of 120 mg to 240 mg daily in three divided doses have been studied. This represents 24% ginkgo flavone glycosides (primarily quercetin, kaempferol, and isorhamnetin) and 6% terpenoids (2.8 to 3.4% ginkgolides A, B, and C and 2.6 to 3.2% bilobalide).

Ginkgo dosage for cerebral insufficiency

For cerebral insufficiency, the dosage suggested is 120 mg to 160 mg in three divided doses daily for up to 12 weeks. That amount was shown to improve concentration and functional status, and to reduce headaches, dizziness, depression and anxiety.

The bottom line

Hawthorn is a helpful botanical agent for treating mild to moderate congestive heart failure as well as aiding in lipid management. It also can be useful in improving overall cardiac function and effectiveness. Curcumin is helpful in reducing inflammation that can trigger cardiovascular problems. Ginkgo is beneficial in treating claudication, dementia and cerebral insufficiency caused by circulatory issues.

Contributor's biography

Dr. Beverly Yates is a California-licensed doctor of naturopathic medicine and a graduate of the National College of Natural Medicine (NCMN) in Portland, Oregon. She maintains a clinical practice in California, where she focuses on the use of plant-based, nature-derived solutions to chronic health problems. Dr. Yates, an integrative medicine pioneer, has served as the lead supervising doctor for the first fully accredited naturopathic and integrative medical residency in California. She also serves as a governor-appointed member of California's Naturopathic Medicine Committee. Dr. Yates is a national media representative for the American Association of Naturopathic Physicians, and an accomplished author and speaker, featured frequently on television and radio, and in print media. Dr. Yates is a member of the Scientific Advisory Board of ***Gaia Herbs Professional Solutions.***