1. **Review of Herbal and Natural Supplements in Cardiovascular Disease and Diabetes Mellitus**  
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2. **Supplements and Your Health: The Good, The Bad and The Ugly**

3. **Hypertension and Cardiovascular Diseases**  
Garlic  
*Allium sativum*

4. **Hypertension and Cardiovascular Diseases**  
- Garlic has been mentioned in medicinal texts since the Ebers papyrus (circa 1550 BC).  
- Used for treatment of infectious conditions because of its presumed antimicrobial and immune-enhancing properties.  
- Garlic is thought to have cholesterol-lowering and other antiatherosclerotic and antihypertensive effects and is used for prevention of cardiovascular disease.  
- Despite such claims, a recent study concluded that raw, powdered, or aged garlic extract versus placebo for 6 months had no significant effect on low-density lipoprotein cholesterol. However, the risk of bleeding in people using anticoagulant or antiplatelet agents increases, so its concomitant use should be avoided.  
- Garlic supplements should be discontinued about 10 days before elective surgical procedures, especially by patients taking aspirin or warfarin.

5. **Hypertension and Cardiovascular Diseases**  
Green Oats  
*Avena sativa*

6. **Hypertension and Cardiovascular Diseases**  
- A diet containing soluble fiber-rich whole oats can significantly reduce the need for antihypertensive medication and improve BP control. Considering the lipid and glucose improvements as well, increased consumption of whole oats may significantly reduce cardiovascular disease risk.  
- The addition of oat cereals to the normal diet of patients with HTN has been found to significantly reduce both systolic and diastolic BP. Soluble fiber-rich whole oats may be an effective dietary therapy in the prevention and adjunct treatment of HTN.

7. **Hypertension and Cardiovascular Diseases**  
Tomato  
*Solanum lycopersicum*

8. **Hypertension and Cardiovascular Diseases**  
- Tomato extract contains carotenoids, such as lycopene, beta carotene, and vitamin E, which are known as effective antioxidants, to inactivate free radicals and to slow the progress of atherosclerosis.  
- A study showed that extract of tomato (Lyc-O-Mato) modestly reduces BP in patients with mild, untreated HTN. A significant correlation has been observed between systolic BP and lycopene levels.
• Tomato extract when added to patients treated with low doses of ACE inhibition, calcium channel blockers, or their combination with low-dose diuretics had a clinically significant effect-reduction of BP by more than 10 mmHg systolic and more than 5 mmHg diastolic pressure.

9  Hypertension and Cardiovascular Diseases
Pomegranate
* Punica granatum *

10  Hypertension and Cardiovascular Diseases
• Pomegranate juice is becoming a more popular fruit drink. Research shows that pomegranate reduces the activity of angiotensin converting enzymes (ACE) by about 36%.
• Clinical research reveals contradictory results. One study shows modest reduction in systolic BP after drinking 50 ml/day of pomegranate juice for a year. Another study shows no benefit after drinking 240 ml/day of the juice for 3 months.

11  Hypertension and Cardiovascular Diseases
Chocolate, cocoa beans, cocoa butter
* Theobroma cacao *

12  Hypertension and Cardiovascular Diseases
• Cocoa powder, enriched with flavonoid constituents, is used for preventing cardiovascular disease. Flavonoids, contained in chocolate, stimulate formation of nitric oxide, increase vasodilatation, and reduce endothelial dysfunction.
• A growing body of clinical research also shows that daily consumption of dark or milk chocolate (T. cacao), 46 to 105 g daily, providing 213 to 500 mg of cocoa polyphenols, can lower systolic BP by about 5 mmHg and diastolic by about 3 mmHg.

13  Hypertension and Cardiovascular Diseases
Coenzyme Q10

14  Hypertension and Cardiovascular Diseases
• Coenzyme Q10, or CoQ10, or ubiquinone, is a chemical that plays a crucial role in a cell’s ability to extract energy from food. Because the heart is the hardest working muscle in your body, it's essential that your heart have a constant supply of CoQ10 so it has energy to do its work. This chemical decreases with age and low cholesterol also depletes it.
• Study shows that taking CoQ10 supplements reduces oxidative stress and increases antioxidant enzyme activity, relieving symptoms of cardiovascular disease. CoQ10 is safe and well-tolerated and although it's not readily absorbed orally, a more “bioavailable” form, ubiquinol, offers better absorption into your bloodstream.
• Statin therapy can deplete CoQ10, therefore anyone taking a statin drug should consider taking CoQ10 supplements.

15  Hypertension and Cardiovascular Diseases
Caffeine

16  Hypertension and Cardiovascular Diseases
• Consuming 200 to 300 milligrams of caffeine can temporarily cause a spike in your blood pressure, but it's unclear whether the effect is temporary or long lasting.
• Caffeine may temporarily increase your blood pressure by blocking a hormone that keeps your blood vessels widened, allowing blood to easily flow through them. In addition, caffeine may cause you to produce more cortisol and adrenaline, which makes your blood flow faster, thus increasing your blood pressure. Although there isn’t enough evidence to prove that caffeine raises your blood pressure long term.
• Examples of caffeine-containing medications and products include:
  – Caffeine pills (Vivarin, others)
  – Coffee, energy drinks and other beverages
• Some studies suggest that coffee may contain a substance that lowers blood pressure, thus counteracting any effects from caffeine. In addition, the caffeine content of coffee can vary widely, so it’s difficult to say how many cups of coffee you can drink a day.
• To see if caffeine raises your blood pressure, check your blood pressure about 30 minutes after drinking a cup of coffee or another caffeinated beverage you regularly drink. If your blood pressure increases by five to 10 points, you may be sensitive to the blood pressure raising effects of caffeine.

17 Hypertension and Cardiovascular Diseases
St. John's Wort

18 Hypertension and Cardiovascular Diseases
• St. John's wort is one of the top 10 best-selling herbs in the U.S. It is typically used to treat depression, anxiety, sleep disorders, the common cold, herpes, and the human immunodeficiency virus. It is used as a topical analgesic, and even as an enema for ulcerative colitis.
• Use of St. John's wort could potentially result in serious adverse reactions because of its effect on drug metabolism; it induces the hepatic cytochrome P450 system, particularly CYP3A4, an enzyme involved in oxidative metabolism of more than 50% of all prescription medications. Therefore, coadministration of this herb and drugs metabolized by CYP3A4 should be avoided, as it may result in reduced bioavailability and effectiveness with subsequent recurrence of arrhythmia, hypertension, or other undesirable effects.
• Reduced drug levels of ethinyl estradiol, indinavir, and cyclosporine have been reported in patients using St. John's wort. In 1 study of organ transplant patients, St. John's wort caused a decrease of almost 50% in the concentration of cyclosporine. A similar experience was reported in renal and cardiac transplant patients who had a reduction in the efficacy of immunosuppressants taken with St. John's wort, with consequent transplant rejection.
• Concomitant use of warfarin with St. John's wort decreases prothrombin time, which may result in subtherapeutic anticoagulation and increased risk of thromboembolism. People taking warfarin who have a history of stroke, thrombosis, atrial fibrillation, or prosthetic cardiac valves should avoid the use of St. John's wort.
• Reduced concentrations of statins may increase the risk of cardiovascular events.
• St. John's wort can induce the multidrug resistance gene product P-glycoprotein, which may reduce the blood levels and efficacy of drugs such as digoxin, which is normally excreted by this glycoprotein.
• Hypoglycemia may occur with concomitant use of antidiabetes agents.
• Serotonin syndrome, a potentially life-threatening adverse drug reaction caused by excess serotonergic activity in the central and peripheral nervous system, has also
Garlic has been mentioned in medicinal texts since the

When Philippine researchers had men and women take bitter melon in capsule form

Researchers have found that ginseng slows carbohydrate absorption; increases cells' participation in the production of energy in the cell and is seen as a possible stimulant for the immune system.

Black cohosh contains triterpene glycosides and has been used in remedies for relief of menopausal symptoms. It is generally safe, but should be avoided by pregnant women. It contains potential inhibitors of CYP3A4.

CoenzymeQ10, or CoQ10, or ubiquinone, is a chemical that plays a crucial role in a cell's ability to extract energy from food. Because the heart is the hardest working muscle in the body, the heart is one of the highest users of CoQ10.

is contraindicated in patients with hypertension, angina, and renal disease. The concurrent use of ginkgo with antiplatelet, anticoagulant, or antithrombotic agents increases the risk of bleeding, hematoma, and intracranial hemorrhage. In clinical trials, ginkgo has also been shown to reduce the effectiveness of nicardipine by interacting with the cytochrome P450 system.

Ginseng can produce effects similar to those of estrogen because its active components, ginsenosides, have a chemical structure similar to that of testosterone, estrogen, and glucocorticoids. Ginseng should not be used by women who are pregnant or receiving hormone replacement therapy. Neonatal death has been related to maternal use.

Increased levels of digoxin are associated with Siberian ginseng.

Ginkgo biloba

Ginko biloba is widely used for conditions such as cardiovascular disease, cerebrovascular or peripheral vascular insufficiency, impotence, inner ear dysfunction, retinopathy, pre-menstrual syndrome, stress, depression, and dementia.

Ginkgo is one of the best-selling herbal remedies in the U.S. for cognitive impairment. However, early trials that suggested it had beneficial effects on cognition were limited by inadequate methods, low numbers of patients, absence of hard end points, and publication bias. Recent randomized trials showed no difference between ginkgo and placebo.

The concurrent use of ginkgo with antiplatelet, anticoagulant, or antithrombotic agents increases the risk of bleeding, hematoma, and intracranial hemorrhage. In clinical trials, ginkgo has also been shown to reduce the effectiveness of nicardipine by interacting with the cytochrome P450 system.

Grapefruit juice

The Grapefruit is used as a dietary intervention to lose weight and improve cardiovascular health.

Its constituents of naringenin and bergamottin inhibit the CYP3A4 enzyme in small-intestine enterocytes, which increases blood levels of CYP3A4 substrate drugs, including calcium-channel blockers, cyclosporine, statins, midazolam, estrogen, and terazosin. The action of these medications is potentiated by their increased bioavailability, which potentially can result in dangerous hypotension, myopathy, or
liver toxicity.

- In post-menopausal women taking estrogen, grapefruit juice may increase the risk of breast cancer by inhibiting estrogen metabolism by CYP3A4.

25 Hypertension and Cardiovascular Diseases
Hawthorn

26 Hypertension and Cardiovascular Diseases
- Hawthorn extract is commonly used by herbalists for treatment of angina, CHF, bradyarrhythmia, and cerebral insufficiency. Hawthorn has positive inotropic and vasodilatory effects and is thought to increase myocardial perfusion and reduce afterload.
- As an adjunct treatment for CHF, hawthorn has been reported to have beneficial effects on symptom control and physiologic outcomes, but the efficacy and safety of its supposed inotropic activity and effect on morbidity and mortality have not been systematically assessed.
- Hawthorn enhances the activity of digitalis (digoxin), and its concomitant use should be monitored carefully for potential toxic effects.
- Hawthorn also inhibits the biosynthesis of thromboxane A2, and it could potentially increase the risk of bleeding in patients taking antiplatelet or anticoagulant agents.
- Unsupervised use of hawthorn in patients with CHF who are taking heart failure medications should be discouraged.

27 Hypertension and Cardiovascular Diseases
Saw Palmetto

28 Hypertension and Cardiovascular Diseases
- Saw palmetto is used by more than 2 million men for treatment of benign prostatic hypertrophy (BPH). It is also used as a diuretic and a urinary antiseptic.
- The exact biologic mechanism of action of saw palmetto is not clear. In vitro, it potently inhibits alpha1-adrenergic receptors. Despite claims that saw palmetto helps relieve BPH symptoms, recent clinical trials did not demonstrate any beneficial effects on BPH symptoms or post-void residual bladder volume.
- Saw palmetto inhibits cyclooxygenase and increases bleeding with warfarin. In addition, its unsupervised use can result in cholestatic hepatitis, acute pancreatitis, and intraoperative floppy iris syndrome during cataract removal because of loss of iris tone.

29 Hypertension and Cardiovascular Diseases
Yohimbine

30 Hypertension and Cardiovascular Diseases
- Yohimbine is marketed for treatment of sexual disorders and exhaustion.
- Many of its effects are attributed to its alpha2-adrenergic receptor antagonist activity.
- Yohimbine increases the release of norepinephrine, resulting in inadequate blood pressure control in people also using antihypertensive and diuretic agents.
- Use of yohimbine is contraindicated in patients with hypertension, angina, and renal impairment.

31 Hypertension and Cardiovascular Diseases
Black Cohosh
Hypertension and Cardiovascular Diseases

- Black cohosh contains triterpene glycosides and has been used in remedies for relief of symptoms of menopause, pre-menstrual tension, and other gynecologic problems.
- Sales of black cohosh supplements soared ($79 million in 2003).
- The mechanism of action is unclear. It may bind to estrogen and serotonin receptors.
- After estrogen replacement therapy was shown to increase the risk of thromboembolic and cardiovascular events and breast cancer.
- In 2006, a clinical trial supported by the National Center for Complementary and Alternative Medicine failed to show that treatments containing black cohosh relieved menopause-associated symptoms.
- Commercially available dietary supplements made from black cohosh inhibit CYP3A4 and potentially increase the risk of adverse effects from some drugs. Hepatotoxicity has been reported, and black cohosh should not be used during pregnancy or lactation.

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Diabetes Mellitus or Type II Diabetes
Bitter Melon

- Bitter melon is used to lower blood sugar. Typical dose is 50 to 100 ml of juice or capsules.
- The bitter melon is thought to help cells use glucose more effectively and block sugar absorption in the intestine.
- When Philippine researchers had men and women take bitter melon in capsule form for three months, they had slight, but consistently, lower blood sugar than those taking a placebo.
- Gastrointestinal problems are possible side effects.

Diabetes Mellitus or Type II Diabetes
Magnesium

- Magnesium deficiency is not uncommon in people with diabetes, and it can worsen high blood sugar and insulin resistance.
- Some studies suggest that supplementing with magnesium may improve insulin function and lower blood sugar levels, but other studies have shown no benefit.
• Have your doctor check you for deficiency before supplementing with magnesium. Usual dose is 250 to 350 mg.

**Diabetes Mellitus or Type II Diabetes**

**Prickly Pear Cactus**

**Diabetes Mellitus or Type II Diabetes**

- The ripe fruit of this cactus has been shown in some small studies to lower blood sugar levels.
- You may be able to find the fruit in your grocery store, but if not, look for it as a juice or powder at health food stores.
- Researchers speculate that the fruit may possibly lower blood sugar because it contains components that work similarly to insulin.
- The fruit is also high in fiber.
- Usual dose will be half cup of cooked fruit or look for label information.

**Diabetes Mellitus or Type II Diabetes**

**Gamma-Linolenic Acid**

**Diabetes Mellitus or Type II Diabetes**

- Gamma-linolenic acid, or GLA, is a fatty acid found in evening primrose oil.
- Some research suggests that people with diabetes have lower than optimal levels of GLA, and studies have found that the supplement can reduce and prevent nerve pain associated with diabetes.
- Usual doses are 270 to 540 milligrams once a day.

**Diabetes Mellitus or Type II Diabetes**

**Alpha Linolenic Acid**

**Diabetes Mellitus or Type II Diabetes**

- Called ALA for short, this vitamin-like substance neutralizes many types of free radicals. A build-up of free radicals, caused in part by high blood sugar, can lead to nerve damage and other problems.
- ALA may also help muscle cells take up blood sugar. In a German study, a team of scientists had 40 adults take either an ALA supplement or a placebo. At the end of the four-week study, the ALA group had improved their insulin sensitivity 27 percent. The placebo group showed no improvement.
- Other studies have shown a decrease in nerve pain, numbness, and burning.
- Usual doses are 600 to 800 milligrams a day.

**Diabetes Mellitus or Type II Diabetes**

**Chromium**

**Diabetes Mellitus or Type II Diabetes**

- This trace mineral is thought to enhance the action of insulin as well as being involved in carbohydrate, fat, and protein metabolism.
- Some research shows that it helps normalize blood sugar but only in people who are deficient in chromium.
- Typical dose is 200 micrograms once daily.

**Diabetes Mellitus or Type II Diabetes**
Bilberry

47 Diabetes Mellitus or Type II Diabetes
• Bilberry has been believe to protect the eye health.
• This relative of blueberry contains powerful antioxidants in its fruit and leaves. These antioxidants, called anthocyanidins, seem to help prevent damage to tiny blood vessels that can result in nerve pain and retinopathy (damage to the eye’s retina).
• Typical doses are between 80 to 120 milligrams two times per day.

48 Diabetes Mellitus or Type II Diabetes
Fennugreek

49 Diabetes Mellitus or Type II Diabetes
• These seeds, used in Indian cooking, have been found to lower blood sugar, increase insulin sensitivity, and reduce high cholesterol, according to several animal and human studies.
• The effect may be partly due to the seeds’ high fiber content. The seeds also contain an amino acid that appears to boost the release of insulin.
• In one of the largest studies on fenugreek, 60 people who took 25 grams daily showed significant improvements in blood sugar control and post-meal spikes.
• Usual doses are 5 to 30 grams with each meal or 15 to 90 grams with one meal per day.

50 Diabetes Mellitus or Type II Diabetes
Ginseng

51 Diabetes Mellitus or Type II Diabetes
• Known for its immune-boosting and disease-fighting benefits, this Chinese herb has several positive diabetes studies behind it.
• Researchers have found that ginseng slows carbohydrate absorption; increases cells’ ability to use glucose; and increases insulin secretion from the pancreas. A team from the University of Toronto has repeatedly demonstrated that ginseng capsules lower blood glucose 15 to 20 percent compared to placebo pills.
• Usual doses are 1 to 3 grams a day in capsule or tablet form, or 3 to 5 milliliters of tincture three times a day.
• As we discussed earlier, this herbal supplement is not recommended for people who have CVD and take anticoagulants and loop diuretics.

52 Diabetes Mellitus or Type II Diabetes
Cinnamon

53 Diabetes Mellitus or Type II Diabetes
• Its compound hydroxychalcone seems to stimulate insulin receptors on cells, which improves your ability to absorb blood sugar.
• University of California–Davis researchers who recently reviewed eight cinnamon studies report that about half to one teaspoon a day lowered fasting blood sugar levels an average of nine points in those with diabetes.
• Usual dose is 500 mg of cinnamon extract twice daily in capsule form, or one half to about one teaspoon of ground cinnamon daily.
• Cinnamon may not help you reach a healthy A1C goal of less than 7 percent but could help along with other diabetes medications, says Evan Sisson, PharmD, MHA, CDE,
associate professor in the department of pharmacotherapy and outcomes science at Virginia Commonwealth University.

- Cinnamon is not recommended in people with liver damage.

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