

## Supplements for Heart Health



Richard E. Collins, MD  
Susan Buckley, RD

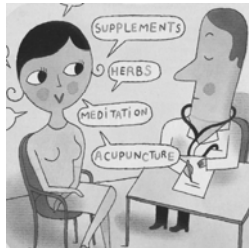
## Supplements for Heart Health

- Approximately 83% of all Americans use some form of dietary supplement
- 2010 total sales for the US dietary supplement industry: \$25 billion
- Includes vitamins, minerals, herbs/botanicals, sports supplements, meal supplements and weight loss products



## Eisenberg's Study Opens The Door of CAM –Complementary and Alternative Medicine

- Nearly 1/3 of people over 65 use some form of alternative medicine .
- 425 million visits to alternative providers.
- 40% of insurers covering some forms of CAM.
- 70% of consumers never told physicians.



## Why do we seek it?

- Back pain
- Allergies
- Insomnia
- Arthritis
- Sprains
- Headache
- High blood pressure
- Digestive
- Anxiety
- Depression

## Natural Remedies

- Studies show people clearly believe that more natural treatments are more desirable
- People increasingly interested in finding holistic solutions to their health problems
- Shift in last 10-15 years where people don't want to just use drugs to mask symptoms
- Want to figure out underlying problems such as nutritional deficiencies which are making conditions worse

## Interesting aspects of CAM

- Patients are more willing to pay for out of pocket expenses.
- More satisfied with interactions of unorthodox rather than orthodox practitioners (time!)
- Low cost interventions are being substituted for high cost drugs & technology



### Be Wise

- Must consider the potential side effects many supplements have
- Don't assume that because supplements are sold OTC you can take as many as you want without considering about side effects/interactions
- Some natural remedies are pretty powerful

### Be Wise

- An investigation from the U.S. Government Accountability Office published this past May found that sales staff at herbal-supplement retailers often gave incorrect or even potentially harmful advice, such as saying a supplement was safe to take with a drug when it wasn't

### Whole Foods vs Supplements

- Best source of vitamins and minerals
- Offer 3 main benefits over supplements:
- Greater Nutrition: Whole Foods are complex – contain variety of micronutrients. For example an orange has more than just vitamin C. It has beta carotene, fiber, calcium and other nutrients.



### Whole Foods

- Protective substances: Fruits and vegetables have substances such as phytochemicals, and antioxidants that slow down oxidation which can lead to cell and tissue damage
- Food Synergy!



### How does the Federal Government regulate supplements?

- FDA regulates supplements as foods rather than drugs
- Laws less strict than for drugs
- Manufacturer does not have to prove supplement is safe
- Manufacturer does not have to prove supplement is effective



### Supplements

- Manufacturer does not have to prove supplement quality
- FDA does not analyze content of supplements
- Put burden of proof on FDA to prove supplements ARE harmful (Ephedra) rather than safe



### Comparing Drugs and Supplements Drugs:

- Highly regulated
- High cost
- Available only after rigorous and large clinical trials
- High quality control
- Well-supported claims (this can go wrong)
- Highly effective relief of *symptoms*
- Side effects may be harsh



### Drugs



- According to the Journal of the American Medical Association (JAMA):
- 106,000 hospitalized patients **die** each year from drugs which are *properly prescribed and properly administered*
- More than 2 million suffer serious side effects
- **4<sup>th</sup> leading cause of death** after heart disease, cancer and stroke

### Comparing Drugs and Supplements Supplements:

- Not as well regulated
- Most are inexpensive
- Vitamin/mineral use is based on decades of research
- Herbal supplements have been used for centuries by practitioners of medicine
- Less quality control
- Claims sometimes exaggerated
- Milder action, fewer side effects



### Dietary Supplements



- Manufacturers cannot put a patent on a supplement or vitamin
- Little incentive for anyone to pay for long term research studies for supplements
- “Proprietary blend” can be patented
- Pharmaceutical drugs can be patented
- More scientific evidence for medications
- Huge financial incentive

### Standardization

- Some manufacturer's use the term “standardized” to describe efforts to make their products consistent
- U.S. law does not define standardization
- Use of this term (or terms such as “verified” or “certified”) does not guarantee product quality or consistency
- Consumerlab.com

### When considering supplements

- Never discontinue or start a medication/supplement without talking with doctor/healthcare provider
- Realize that supplements do NOT replace a healthy diet and exercise
- Find the best product. Consumerlab.com evaluates supplements on the market



### When considering supplements

- Use one supplement at a time and take it for a trial of 6 weeks.
- Make sure you are taking an effective dose
- If supplement is not working for you, you may need to increase dose, switch to a more reputable brand or discontinue

### When considering supplements

- Look for trusted brands that have been around for some time
- Read the label. Serving size. Active ingredients. Amount of active ingredient. What else is in it.
- Look for "USP" on the label. Ensures supplement meets standards for strength, purity, disintegration and dissolution established by the testing organization U.S. Pharmacopeia (USP)

### What to look for

- Expiration date. Supplements lose potency over time. If no expiration date – don't buy it
- Avoid megadoses, especially in multivitamins/minerals. In general aim for 100% DV (water soluble vitamins B, C can be higher)
- Watch for extras: allergens, fillers or binders, artificial colors/flavorings

### When considering supplements

- 3<sup>rd</sup> party evaluations: NSF, USP, NNFA (National Nutritional Foods Association) or Consumer Lab
- All supplements must contain
- manufacturer's information:
- address, phone number.
- Call them with any questions you have



### Multi-vitamins/minerals

- Nutritional "reassurance" to cover dietary shortfalls
- Take based on age and sex
- Do not take megadoses
- 100% of Daily Value (DV) –especially fat-soluble vitamins/minerals (A, D, E & K)
- Take with food!

### Are You Getting Too Much?

- A day's worth of vitamin-boasted foods and snacks, plus just a single supplement can add up to excessive and potentially harmful doses of key nutrients over time
- 1 Women's daily multivitamin/mineral
- 1 bowl Total cereal
- 1 sandwich on fortified bread
- 1 8oz vitamin fortified water
- 1 fortified snack bar
- =300% DV Vitamin A, 237% DV vitamin E, 214% DV folic acid

### Drug/Food Interactions

- Foods can alter drug's effectiveness
- Older patients particularly at risk
- Effect can be negative or positive
- Foods can either interfere with the body's ability to absorb a medication, reducing the dose actually received, or can increase absorption which can improve availability of the drug or pose the risk of toxicity

### Grapefruit Juice

- Interferes with cytochrome P450 enzyme system – enzymes in the liver responsible for metabolizing about 50% of drugs currently prescribed
- Just as individuals have unique fingerprint and DNA profiles, each has a unique P450 profile
- There is a *100-fold variation* of P450 systems among people and this impacts how they metabolize drugs

### Food/Drug Interactions

● Drug	Food	Increase	Decrease
● Statins	Grapefruit	x	
● Plavix	Fatty Fish	x	
● Beta blockers	Meat	x	
● Black Tea	Dozens	x	
● Thyroid Meds	Soy		x
● Coumadin	Leafy greens		x
● MAOIs	Tyramine/Tryptophan	x	
● Beta Blockers	Natural Licorice		x
● Antibiotics	Milk/calcium		x
● Anti-depressants	Chocolate/ Cheddar cheese	x	

### Omega 3 Fatty Acids

- Active ingredients EPA and DHA
- Reduce risk stroke and heart attacks
- Make arteries more elastic and reduce blood pressure
- Reduce triglycerides
- Think the blood – similar to aspirin
- Don't take before surgery!
- Prevent plaque rupture in arteries
- Reduce symptoms of atrial fib



### Fish Oils

- Quality matters in fish oils
- Pharmaceutical grade, molecularly distilled to reduce PCBs, mercury, dioxin
- EPA + DHA = 1,000 to 5,000 mg depending on diagnosis and other medications
- For general heart health 1,000 – 2,000 mg EPA + DHA per day
- Can increase effects of blood pressure meds

### Folic Acid

- Water soluble vitamin
- Recommended 400 mcg per day from supplements and food
- Lots of foods fortified with folic acid
- Don't take more-except pregnant/lactating
- Might increase risk of heart attack in people who have heart problems
- Megadoses might increase risk of cancer

### Folic Acid

- Foods high in folic acid:
- Lots of Breakfast cereals fortified with 100% of the DV
- Beef liver, 3 oz 185 mcg
- Blackeyed peas ½ cup 105 mcg
- Spinach ½ cup cooked 100 mcg
- Great Northern Beans ½ cup 90 mcg

### Coenzyme Q10

- Vitamin like substance found throughout body
- Especially in heart, liver, kidney, pancreas
- Helps body in production of energy for cells
- Statins reduce levels of Co Q 10 in the body. 100-200 mg per day with food.
- Used in CHF, high blood pressure, migranes

### CoQ10 for Pulmonary Hypertension

- One of the nutrients most often recommended to support a failing heart
- Acts as an antioxidant
- Made in the body and found in many foods
- Coenzyme Q is available from three basic types of foods: (1) fish; (2) organ meats, including liver, kidney and heart; and (3) the germs of whole grains.

### CoQ10

- Chemically similar to vitamin K
- Theoretical interaction with Coumadin
- Talk with your doctor before starting and before discontinuing
- Other drugs that decrease CoQ10 levels include gemfibrozil, atenolol, propranolol, tricyclic antidepressants such as amitriptyline, doxepin and imipramine and beta blockers

### Niacin

- B vitamin
- Lowers cholesterol
- Increases HDL cholesterol
- Can cause flushing, aspirin can help
- Can have lots of interactions at higher doses
- Work with health care provider
- Doses up to 2,000 mg per day

### Hawthorn

- Hawthorn is a plant
- Can help improve amount of blood pumped out of heart during contractions and widen blood vessels
- For heart failure, standardized hawthorn leaf with flower extract 160 to 1800 mg (3.5-39.6 mg of total flavonoids calculated as hyperoside or 30-338 mg of proantocyanidins) has been used in 2-3 divided doses daily. It should be used for 4 to 8 weeks to determine benefit.

### Red Yeast Rice

- Product of rice fermented with *Monascus purpureus* yeast
- Effective for high cholesterol and triglycerides
- Same chemical structure as lovastatin (Mevacor) – DO NOT TAKE WITH STATINS!
- No long term studies
- Can cause same side effects as statins such as liver damage and severe muscle pain and damage
- Lots of interactions with meds

### Red Yeast Rice

- Most clinical studies have used a specific brand product (Cholestin-no longer available on market). However, most other red yeast brands contain a similar amount of red yeast, 600 mg per tab.
- For hypercholesterolemia, a typical dose of red yeast is 1200 mg two times daily with food. A total daily dose of 2400 mg red yeast contains approximately 9.6 mg total statins, of which 7.2 mg is lovastatin.

### Potassium

- A mineral necessary for heart functioning, brain activity and muscle movement
- Central to DASH diet – Dietary Approaches to Stop Hypertension
- Effective for lowering hypertension
- 4700 mg per day recommended in DASH
- Careful with ACE inhibitors, angiotensin receptor blockers and potassium-sparing diuretics – can increase potassium to dangerously high levels

### Potassium

- Loop diuretics such as furosemide can cause body to lose a lot of potassium – can be life threatening
- Other drugs that can decrease potassium: NSAIDS like aspirin, ibuprofen, beta-blockers like metoprolol and propranolol, Thiazide such as HCTZ and overuse of antacids

### Potassium

- Can take in supplemental form – doctor may recommend
- Best from food sources
- Baked potato 925 mg in 1 medium
- Low sodium V-8 juice 510 mg in 5.5 oz
- Cantaloupe 475 mg in 1 cup
- Apricot raw halves, 400 mg in 1/5 cup
- Banana 365 mg in 1 banana

### Magnesium

- Responsible for muscle tone in blood vessel walls
- Calcium stimulates smooth muscle while magnesium relaxes it
- Magnesium increases amount of blood flow through heart with each beat
- Helps prevent formation of blood clots
- Diuretics increase loss of magnesium

## Magnesium

- Magnesium can correct heart arrhythmias, relieve muscle cramps, improve sleep and reduce anxiety, depression and effects of stress
- 25 to 38% of diabetics are deficient in magnesium
- Doctor can monitor levels and recommend supplements if needed
- Best sources: magnesium citrate, gluconate, malate and lactate

## Magnesium

- Magnesium oxide or hydroxide can cause diarrhea
- Best food sources of magnesium: whole grains, oatmeal, tofu and soybean flour, Brazil nuts, almonds, cashews, black walnuts, pistachio nuts, pine nuts, pumpkin and squash seeds, peanuts, green leafy vegetables and blackstrap molasses

## Calcium

- Needed to regulate heartbeat and for proper blood clotting
- Required for muscle contraction and nerve transmission
- Helps lower blood pressure, reduce irritability, insomnia, PMS, osteoporosis
- Diuretics cause calcium to be lost in urine
- Calcium can reduce absorption of antibiotics in tetracycline and Cipro, and levothyroxine in thyroid meds

## Calcium

- Soft drinks, sodium, sugar, caffeine and alcohol can increase loss of calcium in urine
- Calcium carbonate is cheapest form of calcium
- Needs acid to be absorbed – must take with meals (Antacids contain carbonate)
- Calcium citrate – better absorption. Can take with or without meals

## Calcium

- Do not take oyster shell calcium, coral, bone meal and Dolomite – these can be contaminated with lead
- Vitamin D enhances absorption of calcium as does magnesium
- Best foods: dairy products, almonds, Brazil nuts, hazelnuts, greens like collards, turnip and mustard, broccoli, kale, dried figs and oysters

## Plant Sterols

- Substances that occur naturally in various plants
- Structurally similar to cholesterol
- Interferes with absorption of cholesterol from food and removes cholesterol from substances made in the liver that are recycled through the digestive tract
- Cholesterol lowering effects in the body

## Plant Sterols

- Dosage is 2,000 mg per day with food
- Promise Activ Supershots
- Promise Activ Spread, Benecol
- Tablet form – Cholest-off, Moduchol
- Some concern as to whether it interferes with absorption of vitamins A, E and D
- No studies show problems at recommended doses

## Garlic

- An herb
- Chemical called allicin
- Possibly effective for high blood pressure, hardening of arteries
- Contradictory evidence about the effects of garlic on cholesterol and triglyceride levels. Most studies flawed.
- Garlic extract 600-1200 mg divided and given three times daily has been used in clinical trials. Most clinical studies have used a standardized garlic powder extract containing 1.3% alliin content

## Grape Seed Extract

- From grapes
- Possibly effective for circulation problems such as chronic venous insufficiency that can cause legs to swell
- Antioxidants help to prevent heart disease
- Grape leaf may reduce inflammation



## Grape Seed Extract

- **Cardiovascular disease:** 200-300mg daily
- **Chronic pancreatitis:** 200-300mg per day has been studied
- **Chronic venous insufficiency:** 150-300mg per day for 28-30 days has been studied
- **Diabetic retinopathy:** 150mg per day for two months has been studied
- **Hypercholesterolemia:** Study in healthy individuals found that tablets containing 200-400mg grape seed extract (GSE) (calculated as proanthocyanidin) exerted reducing effects on oxidized LDL following 12-week administration
- **VITAMIN C:** Preliminary evidence suggests that patients with hypertension who take both vitamin C 500 mg/day plus grape seed polyphenols 1000 mg/day have significantly increased systolic and diastolic blood pressure. The potential mechanism of this interaction is not known.

## Grape Seed Extract

- For chronic venous insufficiency
- Taking grape seed extract seems to reduce subjective symptoms of chronic venous insufficiency and improve venous tone
- In one clinical trial, a specific grape leaf extract, known as red vine leaf extract was given orally to patients with stage I and stage II chronic venous insufficiency.
- Leg edema significantly decreased after 6 weeks of treatment compared to placebo. Doses of 360 mg and 720 mg daily were both effective, but the higher dose produced a slightly greater effect.

## Green Tea



- From Camellia sinensis plant
- Possibly effective for reducing cholesterol
- Antioxidants help protect heart and blood vessels
- More than 5 cups per can cause side effects
- Doses of green tea vary significantly, but usually range between 1-10 cups daily. The commonly used dose of green tea is based on the amount typically consumed in Asian countries, which is about 3 cups per day, providing 240-320 mg of polyphenols

### Green Tea

- Green tea may affect INRs
- If you use Warfarin/Coumadin, keep an eye on your green tea consumption and be consistent in intake



### Vitamin D

- A fat-soluble vitamin
- D3 – cholecalciferol is made by the body and is the preferred form of supplement to take
- D2 – ergocalciferol is most often added to milk and other foods and supplements
- Regulates amount of calcium and phosphorus in body
- High doses combined with diuretic medication may result in too much calcium in body, which can cause kidney problems

### Vitamin D



- Recent studies found that men with low levels of vitamin D in the blood – 15 ng/mL and lower – were at increased risk for heart attack compared to those with 30 mg/mL or higher
- Lower levels associated with higher risk and severity of depression
- Lower levels associated with increased risk of cancer, Alzheimer's, Diabetes

### L-Carnitine

- Amino acid made in the body
- Preliminary studies suggest benefit for ischemia, MI (heart attack), PVD (peripheral vascular disease) Congestive heart failure and arrhythmias
- Helps body produce energy
- Most studies use 2-4 grams
- Interacts with Sintrom, Thyroid hormones and Coumadin
- No series adverse effects reported

### L-Carnitine

- Some studies have suggested that carnitine might be effective in treatment of heart failure
- Results are mixed
- 600 mg 3 x/day used in clinical studies
- Side effects: nausea, vomiting, diarrhea, rash and headache

### L-Carnitine

- Help your body make its own carnitine  
Made from the amino acid lysine in protein foods with help of vitamin C, B6, niacin, iron and the amino acid methionine
- Food sources: lean ground beef, codfish, chicken breast, asparagus
- More studies needed



### Olive Leaf Extract



- May help reduce cholesterol and blood pressure
- 1000 mg per day reduced systolic and diastolic blood pressure by 11 and 5 mmHg, respectively, over 8 weeks in one study
- Active compound called oleuropein as well as other polyphenolic compounds in olive plants act as antioxidants

### Supplements to Avoid if you have Heart Disease

- Vitamin A – beta carotene best
- Ephedra – increase blood pressure, heartbeat, palpitations, heart failure, death
- Chinese black licorice - hypertension
- St. John's wort – activates an enzyme in liver that breaks down many medicines – check interactions before beginning. Don't take with antidepressants
- Yohimbine – increases blood pressure and heart rate

### How to talk with your doctor

- Can feel rushed – write it down!
- Make it clear you want to work as a team
- Be specific about what you want to take and *why*
- Bring in as much information as possible, including printouts from reputable websites
- Listen to feedback

### Remember

- Talk to health care provider: doctor/dietitian
- Be aware some supplement compounds can be toxic if take too much
- Can interact with medications
- ALWAYS discuss supplement use with doctor well in advance of any surgery
- Do not self-diagnose
- Do not substitute supplements for prescription meds or healthy foods
- "Natural" does not mean safe
- Learn to spot false claims –If sounds too good to be true – it probably IS!

### Remember

- Supplements are an alternative way to enhance health
- Will NOT replace healthy diet and exercise
- Each individual is different – supplements work differently for each person as do medications
- You and doctor/dietitian should seek to find best combination of supplements and, if need be, medications that work for YOU!

### Resources

- National Institutes of Health Dietary Supplement Fact Sheets
- Drug Interaction Checker at Drugs.com
- The Drug Digest at drugdigest.org
- Medline Plus

[www.nlm.nih.gov/medlineplus/druginfo](http://www.nlm.nih.gov/medlineplus/druginfo)

*Pharmacists are a great resource!*