

# Integrative Medicine Approach to Preventive Cardiology and Selected Cardiovascular Disease Conditions Protocols /Wayne L. Sodano, DC, DABCI, DACBN, ND/A Webinar with Dicken Weatherby, ND

Integrative Medicine Approach to Preventive Cardiology and  
Selected Cardiovascular Disease Conditions Protocols

by  
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A webinar with Dicken Weatherby, ND



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Integrative Medicine Approach to Preventive  
Cardiology and Selected Cardiovascular Disease  
Conditions Protocols

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**Review of Foundational Preventive Cardiology  
Recommendations**

- Diet
- GI Health: probiotics
- Detoxification
- Exercise prescription
- Mind-Body-Spirit
- Supplementation



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### Dietary

The most widely researched health benefits of the Mediterranean diet are the reduction in cardiovascular disease, including peripheral artery disease. **The available evidence to support a causal vascular protection is sufficiently strong with successful randomized trials.** Other benefits extensively researched include prevention of *type 2 diabetes and metabolic syndrome, cognitive impairment, and unipolar depression.*




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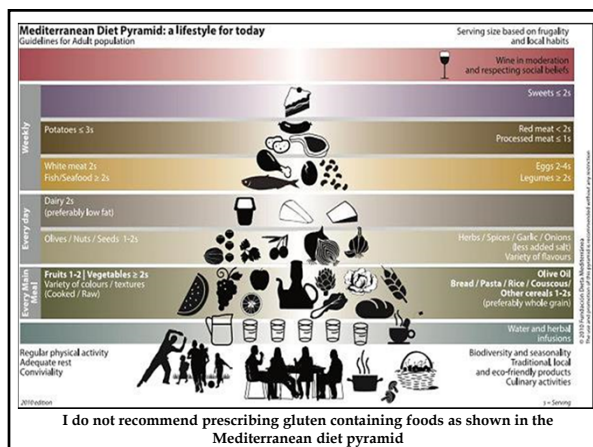
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### A simpler way to prescribe the Mediterranean diet

- **Vegetable:** 1 colorful side salad with lunch and dinner every day and a side of vegetables with dinner (especially broccoli and other cruciferous vegetables, and Swiss chard)
- **Fruit:** berries with breakfast and an apple or orange later in the day (preferably organic)
- **Fish:** 2 fish dinners a week (preferable wild caught, low mercury)
- **Grains:** whole cracked grains (no gluten-containing foods)
- **Oil:** olive oil
- **Red meats:** ≤ 2 per week
- **Herbs and spices:** use liberally
- **Probiotics and prebiotics**

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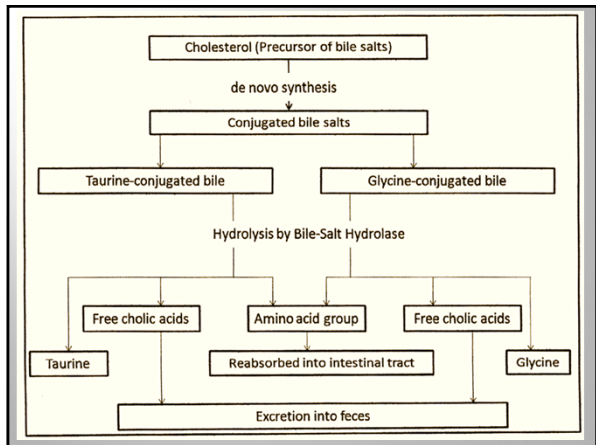
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Detox not only helps those with weight-loss goals, but also serves a therapeutic purpose for those at risk of metabolic syndrome, blood sugar and insulin dysregulation, and cardiovascular disease.

## Mind-Body-Spirit

[illegible]

# Integrative Medicine Approach to Preventive Cardiology and Selected Cardiovascular Disease Conditions Protocols /Wayne L. Sodano, DC, DABCI, DACBN, ND/A Webinar with Dicken Weatherby, ND

## General Adult Nutrient and Supplement Daily Intake

*(Always Check For Nutrient-drug Interact Prior To Prescribing)*

- **Caloric intake:** 2000 – 3000 calories
- **Carbohydrates** (non-processed sources): male 240 – 300 grams; female 160 – 200 grams
- **Fat:** 67 grams (1:2:1 saturated: monounsaturated: polyunsaturated) Use extra-virgin olive oil. No trans fats. Avocados, walnuts, cashews, almonds, nut butter, flaxseed, low mercury containing fish
- **Protein:** 80 – 120 grams (consume more vegetable protein such as beans and soy)
- **Fiber:** 35 to 40 grams
- **Phytonutrients:** fruits, vegetables (esp. cruciferous), dark chocolate, green tea and mushrooms (will provide the food-prebiotics- for the beneficial bacteria)
- **Probiotics, especially lactic acid bacteria** (e.g. *Lactobacillus*, *Bifidobacterium*)

## Vitamins, Minerals and Supplements

- **2 – 3 grams fish oils;** balanced with omega-6 GLA (e.g. borage, evening primrose)
- **Vitamin C** – 200 mgs
- **Selenium** – 200 micrograms
- **Mixed carotenoids** - 10,000 to 15, 000 IU
- **Vitamin D** - 2000 IU with meals
- **Multi-vitamin and multi-mineral without iron:** (unless a need for iron is established); Calcium supplementation has recently come under scrutiny as it related to CVD due to the significant blood level increase in calcium. **The best source of calcium remains in the diet. Magnesium:** “Magnesium has effects that parallel those of statins. For example, the enzyme that deactivates HMG-CoA Reductase requires magnesium, making magnesium a Reductase controller rather than inhibitor.” (400 – 600mg divided into 3 doses)
- **Water:** six to eight glasses of filtered water or drinks that are mostly water (e.g. tea, diluted juice, sparkling water with lemon)

## Manipulative Medicine for Selected Cardiovascular Disease Conditions

|                                          |                                                                                                                                                                                                                                                                                            |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parasympathetic innervation of the heart | Cranial Nerve X (Vagus nerve)                                                                                                                                                                                                                                                              |
| Sympathetic innervation of the heart     | T1 – T5/T6                                                                                                                                                                                                                                                                                 |
| Congestive Heart Failure                 | Adjunctive therapy in CHF patients may normalize lymphatic and autonomic nervous system (ANS) function.<br><b>Diaphragmatic lift and treatment of the thoracic spine may facilitate respiration and therefore lymphatic flow.</b>                                                          |
| Myocardial infarction                    | Normalized autonomic nervous system and lymphatic flow. Rib-raising technique (ribs 1-6): “SNS activity may decrease immediately after <b>rib-raising</b> .” (For more information visit: <a href="http://www.ncbi.nlm.nih.gov/pubmed/20606239">www.ncbi.nlm.nih.gov/pubmed/20606239</a> ) |
| Hypertension                             | Normalized ANS. Rib-raising. <b>T10 and T11</b> address adrenal gland function, which may contribute to HTN by increasing epinephrine production.                                                                                                                                          |
| Arrhythmias                              | <b>Sympathetic tone (rib-raising ribs 1 to 6); parasympathetic tone (cranial techniques, C1 – C3)</b>                                                                                                                                                                                      |

### Acupuncture in Cardiovascular Medicine

- Meridians and acupoints along the meridians in Traditional Chinese Medicine serve as a guide for the therapist, directing them to achieve the best clinical response.
- **Acupuncture works by stimulating somatic sensory neural pathways to activate regions of the brain that regulate autonomic neural outflow, hence cardiovascular function.**
- A number of excitatory and inhibitory neurotransmitters/neuromodulators in both long-and short-loop pathways in the hypothalamus, midbrain, and medulla underlie acupuncture's ability to lower elevated blood pressure.
- Manual and low frequency electro-acupuncture are the most effective forms of stimulation used to lower elevated blood pressure.
- Key features of acupuncture differentiating it from simple somatosensory stimulation are its point-specific effects, slow onset and prolonged action.

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### Dyslipidemia

Dyslipidemia is considered **one of the top five risk factors for cardiovascular disease** along with hypertension, diabetes mellitus, smoking, and obesity.

The pathophysiology

- **Inflammation**
- **Oxidative stress**
- **Autoimmune dysfunction**

Recent studies suggest that **dietary cholesterol intake will not alter serum cholesterol levels** or CHD significantly and that saturated fats have minimal influence on serum lipids and CHD risk, whereas **monounsaturated and polyunsaturated** fats have favorable influence on serum lipids and CHD risk.

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### Hypercholesterolemia: (check hypothyroidism)

Foundation of prevention

**Inhibit HMG CoA** - The following foods/nutraceuticals are known to inhibit this enzyme:

**Red yeast rice:** "Red yeast rice is fermented rice produced by growing red yeast (*Monascus purpureus*) on white rice." 600 - 2,400 mg/day, depending on the monacolin content. Use only preparations that have been assayed for monacolin content and have been certified to contain no detectable citrinin (kidney toxin). Since RYR may deplete CoQ10, it's recommend to prescribe CoQ10 along with RYR.

**Magnesium:** 400-600 mg/day divided doses (**ERRATA**)

**Gamma-linolenic acid:** 500 - 1000mg/d (avoid dosages over 3000mg)

**Plant Sterols** (phytosterols): 2.15g/d

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#### Hypercholesterolemia (continued)

- **Garlic:** 600 to 900 mg/d (standardized extract of allicin and ajoene) "Ajoene is a compound with anti-platelet properties and in addition, was shown to inhibit cholesterol biosynthesis by affecting HMG-CoA Reductase."
- **Curcumin:** 2000 mg/d divided doses
- **Pantethine:** 900mg divided doses with or without food
- **Green tea** (Epigallocatechin Gallate - EGCG): 500-7000mg/d
- **Bergamot** (citrus oil) statin-like effects: 1000mg/d
- **Sesame oil:** 40 g/d
- **Note:** Guggulipids and policosanols are not effective lipid lowering agents.

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#### Decrease Intestinal Cholesterol Absorption

- EGCG
- Fiber
- Flaxseeds: 14 to 40 g/d
- Garlic
- Plant Sterols
- Sesame
- Soy (fermented): 30 – 50 g/d

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#### Decrease Triglycerides

- **Bergamot** (citrus oil)
- **Flaxseed**
- **Olive oil** (monounsaturated fatty acids): 30-40 g/d
- **Niacin:** 500 – 4000 mg/d (Note: dose should be increased gradually and administered at mealtime. Pretreated with 81-mg aspirin and apple pectin to reduce flushing. Non-flush niacin is ineffective in improving lipid profiles.
- **Omega-3 fatty acids**
- **Pantethine**
- **Red Yeast Rice**
- **Resveratrol/N-acetylcysteine:** 250 mg/d and 1000mg twice per day respectively

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**Decrease LDL**

- Bergamot oil
- Curcumin
- EGCG
- Flaxseed
- Garlic
- Monounsaturated fatty acids
- Niacin
- Omega-3 fatty acids
- Pantethine
- Plant Sterols
- Red Yeast Rice
- Resveratrol
- Sesame
- Soluble Fiber
- Tocotrienols: 200mg/d

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**Decrease LDL Particle Number**

- Niacin
- Omega-3 Fatty Acids
- Increase Total HDL
- Bergamot oil
- Curcumin
- Krill oil
- Monounsaturated Fatty Acids
- Niacin
- Pantethine
- Pomegranate: 8 ounces per day
- Red Yeast Rice
- Resveratrol

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**Reduce Lipoprotein (a)**

- Coenzyme Q10: 100 – 200 mg/d
- L-arginine
- L-carnitine
- L-lysine
- N-Acetyl Cysteine
- Niacin

**Decrease Apolipoprotein B**

- EGCG
- Niacin
- Omega-3 Fatty Acids
- Plant Sterols

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| Recommended Doses of Nutraceutical Supplements for Treatment of Dyslipidemia |                             |
|------------------------------------------------------------------------------|-----------------------------|
| Nutrient                                                                     | Recommended Daily Dose      |
| Bergamot                                                                     | 1000 mg                     |
| Curcumin                                                                     | 2000 mg divided doses       |
| EGCG                                                                         | 500 – 700 mg                |
| Flaxseed                                                                     | 40 grams                    |
| Monounsaturated Fatty Acids                                                  | 20-40 grams                 |
| N-Acetyl Cysteine                                                            | 2000 mg divided doses       |
| Niacin                                                                       | 500 – 4000 mg divided doses |
| Omega-3 Fatty Acids                                                          | 3000 – 5000 mg              |
| Pantethine                                                                   | 900 mg divided doses        |
| Phytosterols                                                                 | 2.15 grams                  |
| Pomegranate juice                                                            | 8 ounces                    |
| Resveratrol (Trans Form)                                                     | 250 mg                      |
| Sesame seeds                                                                 | 40 mg                       |
| Soy (fermented)                                                              | 30 – 50 mg                  |
| Tocotrienols (gamma and delta)                                               | 200 mg                      |
| Vitamin C                                                                    | 500 mg                      |

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## Hypertension

Hypertension is mainly a disease of **epigenetic influences** due to various lifestyle abuses.

- Glucose intolerance
- Hyperinsulinemia
- Oxidative stress
- Environmental toxins (especially heavy metals)
- Autoimmune dysfunction
- Atherosclerosis
- Obesity
- Nutritional deficiencies

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## Endothelial Dysfunction

**Target organ** disease of hypertension includes:

- Heart (myocardial infarction)
- Cerebrovascular (TIAs, stroke, dementia)
- Peripheral vascular disease (claudication) retinopathy
- Kidney (renal disease)
- Retina




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### Renin-Angiotensin-Aldosterone System

- **Obesity = low grade inflammation + activation of the RAAS**
- **Chronic activation** of RAAS is related to:
  - Hypertension
  - Insulin resistance
  - Cardiac disease
  - Renal disease
  - Polycystic ovarian syndrome

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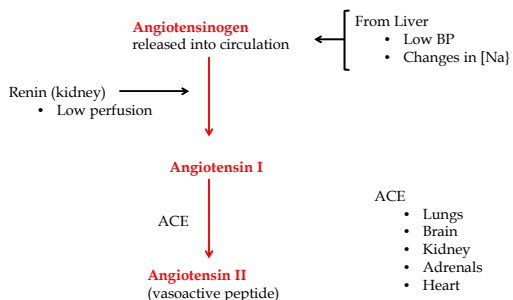
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### Renin-Angiotensin Aldosterone System




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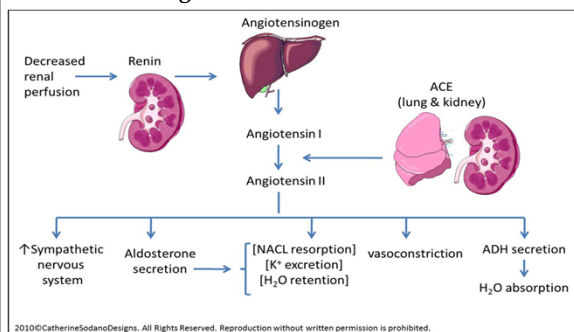
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### Renin-Angiotensin-Aldosterone System Regulator of BP and MORE




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### Alternative Pathways: Ang II

- It has been reported that pts chronically treated with ACE inhibitors do not suppress Ang II production
- Ang II has been detected in peripheral tissue including vascular tissue
- **Adipose tissue** expresses all components of the RAS necessary to generate angiotensin and produce Ang II
- Obesity is associated with increased Ang II
- Oxidative stress is associated with increased Ang II levels

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### Alternative Pathways to Production of Ang II

There is evidence indicating a **link between hypertension and atherosclerosis via Ang II mediated inflammation.**

Animal and human studies show that Ang II has pro-inflammatory responses in arteries, heart, and kidney by regulating the expression of cytokines and chemokines. In human vascular smooth muscle cells, Ang II **induced** NF- $\kappa$ B activation and the expression of IL-6, MCP-1 and TNF $\alpha$  in monocytes.

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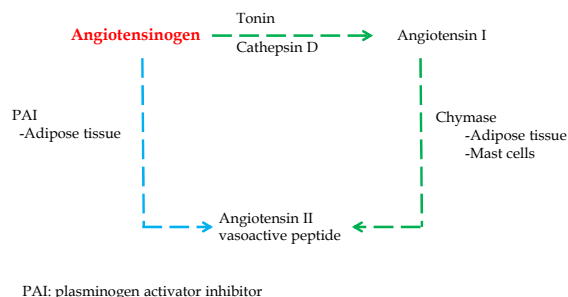
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### Alternative Pathways: Angiotensin II

Does not rely on Renin or ACE




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### Adipose Tissue as an Endocrine Organ

#### Substances produced (esp. in VAT)

- Plasminogen activator inhibitor (↑obesity & IR)
- Renin
- Angiotensinogen
- Ang I & Ang II
- Ang I & Ang II Receptors
- ACE
- Chymase (also released by mast cells)
- Cathepsin D & G
- Tonin

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### Angiotensin Receptors

#### AT<sub>1</sub>-R

- Kidney
- Heart
- SM cells blood vessels
- Brain
- Adrenals
- Platelets
- Adipocytes
- Placenta

#### Action

- Vasoconstriction
- Sodium retention
- Water retention
- Cell growth/proliferation
- Fibrosis
- ROS production
- Inflammation
- Activation SNS

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### Angiotensin Receptors

#### AT<sub>2</sub>-R (low levels)

- Uterus
- Adrenals
- CNS
- Heart
- Kidney

#### Action

- Vasodilation
- Cell antiproliferation
- Tissue repair
- Apoptosis

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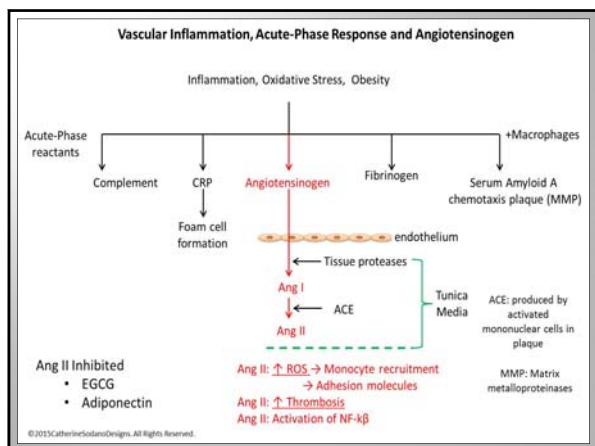
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**Classification of Hypertension**  
Seventh Report of The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood pressure (JNC 7)  
Adults 18 and older

| Classification       | Systolic Blood Pressure (mmHg) |     | Diastolic Blood Pressure (mmHg) |
|----------------------|--------------------------------|-----|---------------------------------|
| Normal               | < 120                          | and | < 80                            |
| Prehypertension      | 120 - 139                      | or  | 80 - 89                         |
| Stage 1 hypertension | 140 - 159                      | or  | 90 - 99                         |
| Stage 2 hypertension | ≥ 160                          | or  | ≥ 100                           |

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**Primary and Secondary Hypertension**

- **Primary Hypertension:** > 90% of the etiology
- **Secondary Hypertension:** Kidney disease, renovascular disease, prescription medications, illicit drugs, coarctation of the aorta, pheochromocytoma, primary aldosteronism, thyroid disease, and parathyroid disease.

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# Integrative Medicine Approach to Preventive Cardiology and Selected Cardiovascular Disease Conditions Protocols /Wayne L. Sodano, DC, DABCI, DACBN, ND/A Webinar with Dicken Weatherby, ND

| Drugs Commonly Linked to Hypertension |                                                                       |                                                                                                                |
|---------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Drug Class                            | Drug Name                                                             | Mechanism of Action                                                                                            |
| Sympathomimetic agents                | Amphetamines<br>phenylpropanolamine,<br>ephedrine,<br>pseudoephedrine | CNS stimulant                                                                                                  |
| NSAIDs and COX-2 inhibitors           | Ibuprofen, diclofenac,<br>celecoxib                                   | Block COX-1 and COX-2 enzymes, which leads to reduction in prostaglandin formation; water and sodium retention |
| Corticosteroids                       | Prednisone,<br>fludrocortisone,<br>hydrocortisone                     | Sodium and fluid retention                                                                                     |
| CNS stimulants                        | Caffeine                                                              | Stimulant effect                                                                                               |

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| Drugs Commonly Linked to Hypertension        |                                                     |                                                                                                                  |
|----------------------------------------------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Drug Class                                   | Drug Name                                           | Mechanism of Action                                                                                              |
| Estrogens and Progestins                     | Oral contraceptives,<br>hormone replacement therapy | Estrogen stimulates hepatic production of angiotensinogen; both appear to contribute in a dose-dependent fashion |
| Dietary supplements                          | Ginseng, natural licorice,<br>yohimbine             | Mild stimulant effect; increase arterial pressure                                                                |
| Serotonin-norepinephrine reuptake inhibitors | Venlafaxine, sibutramine                            | Increase levels of norepinephrine and the subsequent potentiation of noradrenergic neurotransmission             |
| Immunosuppressants                           | Cyclosporine, tacrolimus                            | Increase prostaglandin synthesis and decrease water, sodium, and potassium excretion.                            |

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| Assessment of Patients with Documented Hypertension                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Assess lifestyle and cardiovascular risk factors</p> <ul style="list-style-type: none"> <li>• Cigarette smoking; Oxidative stress – Organic acid test</li> <li>• Autoimmune dysfunction – Innate and adaptive immune responses are linked to hypertension and hypertension-induced CVD through at least three mechanisms: <b>cytokine production, central nervous system stimulation, and renal damage.</b></li> <li>• Diet</li> <li>• Environmental toxin exposure (especially Heavy metal toxicity: Pb, Cd, and/or Hg)</li> <li>• Obesity (BMI <math>\geq 30</math> kg/m<sup>2</sup>); Physical inactivity</li> <li>• Dyslipidemia – Advanced Lipid Panel</li> <li>• Diabetes mellitus – fasting glucose, HbA1c</li> <li>• Renal disease: check urine for microalbuminuria or GFR <math>&lt; 60</math> mL/min</li> <li>• Elevated uric acid levels</li> <li>• Age (men <math>&gt; 55</math>; women <math>&gt; 65</math>) Family history of premature cardiovascular disease (men <math>&lt; 55</math>; women <math>&lt; 65</math>)</li> </ul> |

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#### Assess for Secondary Causes of Hypertension

- Sleep apnea - Sudden drops in blood-oxygen levels occurring during sleep apnea increases blood pressure
- Drug-induced or related causes
- Chronic kidney disease
- Primary aldosteronism
- Renovascular disease
- Chronic steroid therapy (Cushing's syndrome)
- Pheochromocytoma
- Coarctation of the aorta
- Thyroid or parathyroid disease

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#### Hypertension: Target Organ Damage

- Heart
- Left ventricular hypertrophy
- Angina or prior myocardial infarction
- Prior coronary revascularization
- Heart failure
- Cerebrovascular - stroke or transient ischemic attack
- Chronic kidney disease
- Peripheral arterial disease
- Retinopathy

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| Natural Antihypertensive Compounds |                                                                                                                                                                                                                                                 |                                                                                                                |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Therapeutic Class                  | Functional Food                                                                                                                                                                                                                                 | Nutraceutical                                                                                                  |
| ACE inhibitors                     | Egg yolk, fish (bonito, dried salted fish, fish sauce, sardines, tuna), <b>garlic</b> , gelatin, Hawthorne berry, milk products (casein, sour milk, whey-hydrolyzed), sake, sea vegetables (kelp), wheat germ (hydrolyzed), zein (corn protein) | <b>Omega-3</b> , pycnogenol, zinc                                                                              |
| Angiotensin receptor blockers      | <b>Celery</b> , fiber, <b>garlic</b>                                                                                                                                                                                                            | <b>CoQ10</b> , gamma-linolenic acid, potassium, resveratrol, vitamin C, B <sub>6</sub>                         |
| Beta blockers                      | Hawthorne berry                                                                                                                                                                                                                                 |                                                                                                                |
| Calcium channel blockers           | <b>Celery</b> , <b>garlic</b> , Hawthorne berry                                                                                                                                                                                                 | Alpha-lipoic acid, calcium, EPA, DHA, <b>Magnesium</b> , NAC, <b>Omega-3</b> , B <sub>6</sub> , C, E           |
| Central alpha agonists             | <b>Celery</b> , fiber, <b>garlic</b> , protein                                                                                                                                                                                                  | <b>CoQ10</b> , GLA, potassium, taurine, B <sub>6</sub> , C, zinc, decrease sodium                              |
| Direct vasodilators                | <b>Celery</b> , fiber, <b>garlic</b> , soy, cooking oils with monounsaturated fats                                                                                                                                                              | Alpha-lipoic acid, arginine, calcium, flavonoids, <b>magnesium</b> , <b>omega-3</b> , potassium, taurine, C, E |
| Diuretics                          | <b>Celery</b> , Hawthorne berry, protein                                                                                                                                                                                                        | Calcium, <b>CoQ10</b> , fiber, GLA, L-carnitine, <b>magnesium</b> , potassium, taurine, B <sub>6</sub> , C     |

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### Combining Food and Nutrients with Medications

Some nutrients have a **synergistic affect** with consumed with certain medications

- Sesame with beta blockers, diuretics, and nifedipine
- Pycnogenol with ACEI
- Lycopene with various antihypertensive medications
- Alpha-lipoic acid with ACEI
- Vitamin C with calcium channel blockers
- N-acetyl cysteine with arginine
- Garlic with ACEI, diuretics, and beta blockers
- Coenzyme Q10 with ACEI and CCB

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### Recommendations for Hypertension

| Therapeutic intervention             | Daily intake                                                                                                                                                           |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Modified Mediterranean diet          | Incorporating as many functional foods as possible from the table above. (Celery: 4 stalks or celery seed extract - 1000 mg x2 or celery oil ½ to 1 teaspoon three x3) |
| Exercise prescription                | See part 2                                                                                                                                                             |
| Mind-body/ stress reduction          | See part 2                                                                                                                                                             |
| Manipulative Medicine Considerations | See table on manipulative medicine                                                                                                                                     |
| Omega-3, Omega-6 (GLA), Omega-9      | Prescribe per RBC-fatty acid analysis or 3-4 grams of EPA-DHA and 1 gram GLA                                                                                           |
| Magnesium                            | 400 - 800 mg                                                                                                                                                           |
| Vitamin D                            | 2000 IU                                                                                                                                                                |
| B-complex with extra B <sub>6</sub>  | B <sub>6</sub> - 100 mg x2                                                                                                                                             |
| Vitamin C                            | 250 - 500 mg x2                                                                                                                                                        |
| Arginine                             | 5 grams x2                                                                                                                                                             |
| Hawthorne (if needed)                | 1000 to 1500 mg x2                                                                                                                                                     |
| CoQ10                                | 100 mg x2                                                                                                                                                              |
| Nattokinase (if need)                | 50 - 100 mg                                                                                                                                                            |
| Garlic (if not in diet)              | 1000 mg                                                                                                                                                                |

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### Hyperviscosity Syndrome

➤ Hemorheology = flow properties of blood.

➤ Impaired microcirculatory blood flow: increased whole blood or plasma viscosity, erythrocyte aggregation, and decreased RBC deformability due to membrane rigidity. (RBC-fatty acids)

➤ **Sluggish blood flow: pathogenesis of cardiovascular diseases causing by ischemia, increasing blood pressure, or promoting thrombus formation.**

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### Hyperviscosity Syndrome

Blood viscosity: **thickness and stickiness** of blood and is associated with all major risk factors for cardiovascular disease, as well as being implicated in cognitive dysfunction, complications of diabetes, preeclampsia, intrauterine growth retardation, migraines, and other conditions.

**Strong independent predictor of CV events such as stroke and myocardial infarction.**

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### Hyperviscosity Syndrome

Hyperviscosity typically presents with **visual disturbances and neurological signs of headaches and vertigo.**

Hyperviscous blood is **abrasive** and can damage the endothelial cells initiating and/or contributing to endothelial dysfunction. The long-term effect of hyperviscous blood is arterial calcification.

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### Hyperviscosity Syndrome

Blood viscosity is affected by a number of variables that include **blood cells** (e.g. erythrocytes, white cells, and platelets), **plasma proteins** (e.g. fibrinogen, immunoglobulins, and albumin), **lipids, osmolality, and levels of inflammation and stress** (emotional and oxidative).

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### Factors Affecting Blood Viscosity

- Hematocrit - ↑ RBCs = thicker blood
- Erythrocyte deformity (old cells, altered cell membrane)
- Plasma viscosity (hydration, Igs, fibrinogen)
- Erythrocyte aggregation
- Temperature
- Blood viscosity explains plaque location

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### Hyperviscosity Syndrome

Essentially, the **higher the blood viscosity**, the **lower the capacity of the blood to deliver oxygen to the tissues**.

It is well known that **diabetics** have elevated blood viscosity and it has been recently demonstrated that elevated blood viscosity is a risk factor that predicts progression from metabolic syndrome to diabetes.

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| Red Flags for Elevated Whole Blood Viscosity  |            |                |
|-----------------------------------------------|------------|----------------|
| Condition                                     | Modifiable | Non-Modifiable |
| Cardiovascular/Cerebrovascular Diseases       | ✓          |                |
| Smoking                                       | ✓          |                |
| Essential Hypertension                        | ✓          |                |
| Elevated Hematocrit                           | ✓          |                |
| Sedentary Lifestyle                           | ✓          |                |
| Dyslipidemia                                  | ✓          |                |
| Age-Related Macular Degeneration              | ✓          |                |
| Diabetes, Insulin Resistance, Obesity         | ✓          |                |
| Autoimmune Disease                            | ✓          | ✓              |
| Systemic Inflammation/Endothelial dysfunction | ✓          |                |
| Alzheimer's Disease                           | ✓          |                |
| Men Age 50 and Older                          |            | ✓              |
| Heritable Hematologic Disorders               |            | ✓              |
| Plasma Protein Disorders                      |            | ✓              |
| History of Preeclampsia                       |            | ✓              |
| Postmenopause                                 |            | ✓              |

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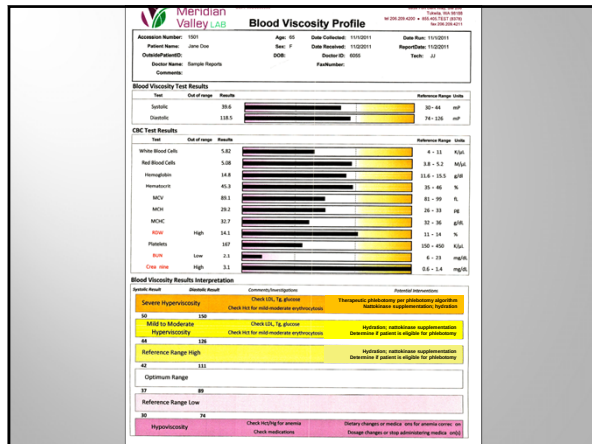
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# Integrative Medicine Approach to Preventive Cardiology and Selected Cardiovascular Disease Conditions Protocols /Wayne L. Sodano, DC, DABCI, DACBN, ND/A Webinar with Dicken Weatherby, ND



## Integrative Medicine Approach to Addressing Increased Blood Viscosity

- Optimize hematocrit
  - 42% men 38% woman (donate blood)
- Erythrocyte deformity
  - RBC - fatty acid test
- Plasma viscosity (adequate hydration)
- RBC Aggregation (affected by RBC deformity and plasma viscosity)
  - ↓ inflammation and allergens
- Temperature
  - Check the HPT- HPA Axes

## Nutritional Approach to Treatment of Increased Blood Viscosity

- Treatment for hyperviscosity syndrome can include hematologic (e.g. phlebotomy), pharmacologic (e.g. statins and antiplatelet agents), and nutritional intervention. The nutritional intervention will only be addressed in this section, which include:
- Addressing the underlying etiological factor(s)
- Proper hydration
- Proper Nutriture
- Oral hydration solutions
- Organic Acid Test to assess oxidative stress level
- Balance Omega-3 Omega-6 (RBC Fatty Acid Analysis)
- Proteolytic enzymes (fresh tropical fruits and nattokinase or lumbrokinase - 6000 fibrinolytic degradation units daily, divided into three to four doses)
- Phosphatidylcholine

(Nattokinase is a fibrinolytic enzyme produced by the microorganism, Bacillus natto. Nattokinase is present in natto, which is fermented soy. Lumbrokinase is an extract from the earthworm, Lumbricus rubellus.)

### **Congestive Heart Failure and Cardiomyopathy**

The complexity of **cardiac energy metabolism** is often misunderstood but is of vital clinical importance.

One characteristic of the failing heart is a **persistent and progressive loss of cellular energy** substrates and abnormalities in cardiac bioenergetics that directly compromise diastolic performance, which has the capacity to impact global cardiac function.

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### **Daily recommendations for individuals with severe CHF**

Dr. Stephen T. Sinatra, MD, formulated the adjunct nutritional recommendations outlined below:

- Multivitamin/mineral combination (I recommend additional thiamine)
- Fish oil: 1 gram
- D-ribose: 15 grams (three 5 gram doses)
- CoQ10: 360 to 600 mg
- L-carnitine: 2500 to 3500 mg
- Magnesium: 400 to 800 mg

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### **D-Ribose**

- Supports ATP production
- Enhances recovery of myocardial ATP
- **Can interact with blood glucose lowering medications**
- **May increase uric acid levels (caution in individuals with gout, kidney disease, kidney stones)**

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| Recommended Laboratory and Diagnostics Monitoring Tests for Most Cardiovascular Diseases |                         |                                                        |                                                            |
|------------------------------------------------------------------------------------------|-------------------------|--------------------------------------------------------|------------------------------------------------------------|
|                                                                                          | Test                    | Rationale                                              | Interval for Repeating Tests                               |
| Blood                                                                                    | Electrolytes and RBC-Mg | Low potassium can increase BP. <b>Mg can reduce BP</b> | Every 2-3 months until normal, then once or twice per year |
| Blood                                                                                    | Homocysteine            | <b>Risk factor CVD</b>                                 | Every 4 months until normal, then yearly                   |
| Blood                                                                                    | Glucose and HbA1C       | <b>Risk factor CVD</b>                                 | Every 4 to 6 months until normal, then yearly              |

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|       | Test                 | Rationale                                                         | Interval for Repeating Tests                                        |
|-------|----------------------|-------------------------------------------------------------------|---------------------------------------------------------------------|
| Blood | Creatinine and BUN   | <b>Renal conditions</b> effect BP and increase risk of CVD        | Every 4 to 6 months                                                 |
| Blood | hs-CRP               | <b>Inflammation</b> is a risk factor for CVD                      | Every 4 to 6 months                                                 |
| Blood | Iron Panel           | Iron increases CVD risk and DM. assess for <b>hemochromatosis</b> | Baseline, then every 4 months until normal, then yearly if elevated |
| Blood | Advanced Lipid Panel | Assess <b>dyslipidemia</b> and other risk factors for CVD         | Baseline, then every 4 months until normal, then yearly if elevated |

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|       | Test                                                                    | Rationale                                                  | Interval for Repeating Tests                            |
|-------|-------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------|
| Blood | Thyroid Panel (TSH, Free T4, Free T3) - Thyroid antibodies if indicated | <b>Thyroid dysfunction</b> is a risk for HTN and CVD       | Baseline, then every 4 months until normal, then yearly |
| Blood | Uric acid                                                               | <b>Elevated uric acid</b> is a risk factor for HTN and CVD | Baseline, then every 4 months until normal, then yearly |
| Blood | Vitamin D                                                               | <b>Deficiency of vitamin D</b> increase BP and CVD risk    | Baseline, then every 4 months until normal, then yearly |

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|       | Test                  | Rationale                                                                      | Interval for Repeating Tests                                                         |
|-------|-----------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Blood | RBC-Fatty Acids Test  | Fatty acid imbalance can cause a pro-inflammatory state and increased CVD risk | Baseline, then every 6 months until normal, then yearly                              |
| Blood | Reproductive hormones | Low estrogen and testosterone are risk factors for HTN and CVD                 | Baseline, if abnormal, every 3-4 months while on treatment until normal, then yearly |

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|                 | Test                                                        | Rationale                                            | Interval for Repeating Tests                              |
|-----------------|-------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------|
| Blood and urine | Heavy metals (recent exposure use blood; chronic use urine) | Associated with HTN, elevated homocysteine           | Baseline                                                  |
| Urine           | Organic Acids Test                                          | Assessment of oxidative stress and antioxidant level | Baseline, then every 6 months until normal, then PRN      |
| Urine           | Urinalysis with microalbuminuria                            | Renal function                                       | Baseline, then every 4-6 months until normal, then yearly |

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|                                | Test                                            | Rationale                           | Interval for Repeating Tests |
|--------------------------------|-------------------------------------------------|-------------------------------------|------------------------------|
| Cardiac imaging and monitoring | ECG                                             | Hypertrophy, arrhythmias, blocks    | Baseline, then yearly        |
| Cardiac imaging and monitoring | Echocardiogram                                  | Cardiac function, ejection fraction | Baseline, then yearly        |
| Cardiac imaging and monitoring | Carotid IMT and duplex (Intima-media thickness) | CVD risk, PAD risk                  | Baseline, then yearly        |

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|                                | Test           | Rationale                                                                                                                                         | Interval for Repeating Tests |
|--------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Cardiac imaging and monitoring | EndoPAT test   | Endothelial vasodilator function- endothelial dysfunction. Can be use to assess nutrient and drug endothelial vasodilation response to treatment. | Baseline, then yearly        |
| Cardiac imaging and monitoring | Treadmill test | Response to exercise: CHD, arrhythmias, HTN                                                                                                       | Baseline, then yearly        |

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|                                       | Test                                         | Rationale                                             | Interval for Repeating Tests                            |
|---------------------------------------|----------------------------------------------|-------------------------------------------------------|---------------------------------------------------------|
| Cardiac imaging and monitoring        | 24-hour ambulatory blood pressure monitoring | More accurate assessment of BP                        | Baseline, PRN                                           |
| Body Composition                      | Anthropometric measurements                  | Visceral adipose tissue, inflammation                 | Baseline, then every 3 months as needed, then yearly    |
| Retinal scan and macular density test | MacuScope Test and retinal scan              | Measures macular density. End organ damage to retinal | Baseline, then every 3 months until normal, then yearly |

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**Additional Cardiovascular Treatment Considerations**

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| Botanical Medicine            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Heart failure and arrhythmias | <ul style="list-style-type: none"> <li>• <b>Purple foxglove</b> (<i>Digitalis purpurea</i> and woolly foxglove contain glycosides that have cardiac effects. (Due to cumulative effects, the glycosides can easily give rise to toxic symptoms such as nausea, vomiting and anorexia – blood levels should be monitored).</li> <li>• <b>Hawthorn</b> – used as a <b>cardio tonic</b>, <b>hypotensive</b>, coronary and peripheral vasodilator, anti-atherosclerotic and anti-arrhythmic. Usual standardized doses is 160 – 900 mg day</li> </ul> |

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|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Venous insufficiency and circulatory disorders | <ul style="list-style-type: none"> <li>• <b>Bilberry</b> – (contains anthocyanosides) was traditionally used as an antidiabetic, and an astringent and antiseptic for diarrhea. Improves venous insufficiency especially for vision disorders such as retinopathy caused by diabetes or hypertension. Usual dose is 480 mg standardized taken in divided doses.</li> <li>• <b>Butcher's Broom</b> – anti-inflammatory effects for venous insufficiency and hemorrhoids. Taken internally as a decoction or applied topically.</li> <li>• <b>Ginkgo</b> – improves circulation, inhibits platelet aggregation. Usual dose 120 – 160 mg/day of extract.</li> <li>• <b>Horse chestnut</b> – usual dose is 600 mg of extract that contains 100 mg of escin.</li> <li>• <b>Red vine leaf</b> – treatment of varicose veins. Taken internally or applied topically</li> </ul> |
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|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Antiplatelet and anti-atherosclerotic | <ul style="list-style-type: none"> <li>• <b>Garlic</b> – additional health benefits include antibacterial, antiviral, and antifungal. May have chemoprotective activity</li> </ul> |
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| Mycotherapy: Medicinal Mushrooms                   |                                                                                                                                                                                                                                                                              |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Chemical composition: Vitamin D<sub>2</sub></b> | <ul style="list-style-type: none"> <li>• Only non-animal source of vitamin D. To enhance vitamin D, mushrooms should be exposed to sunlight</li> </ul>                                                                                                                       |
| <b>Antioxidant</b>                                 | <ul style="list-style-type: none"> <li>• May contain ascorbic acid, carotenoids, superoxide dismutase, tocopherols, phenolic compounds and ergothioneine</li> </ul>                                                                                                          |
| <b>Anti-atherogenic activity</b>                   | <ul style="list-style-type: none"> <li>• Cholesterol regulating: <b>Reishi and Agaricus blazei</b></li> <li>• <b>Shiitake</b> contain the anticholesterol compound eritadenine</li> <li>• <b>Oyster mushroom</b> contains naturally occurring statin - lovastatin</li> </ul> |

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|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Hypoglycemia activity</b>      | <ul style="list-style-type: none"> <li>• <b>Reishi</b> – Ganoderan A and B</li> <li>• <b>Maitake</b> – polysaccharides</li> <li>• <b>Coriolus</b> – glucan-protein</li> <li>• <b>Chaga</b></li> <li>• <b>Cordyceps</b></li> <li>• <b>Agaricus blazei</b></li> </ul> |
| <b>Anti-inflammatory activity</b> | <ul style="list-style-type: none"> <li>• <b>Reishi</b> – stronger activity than acetylsalicylic acid</li> <li>• <b>Ergosterol</b> found in many mushrooms can inhibit COX 1 and COX 2 activity</li> </ul>                                                           |

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|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Cholesterol lowering</b>      | <ul style="list-style-type: none"> <li>• Cordyceps</li> <li>• Reishi</li> <li>• Shiitake</li> <li>• Oyster Mushroom</li> </ul> |
| <b>Anti-platelet aggregation</b> | <ul style="list-style-type: none"> <li>• Reishi</li> <li>• Shiitake</li> </ul>                                                 |
| <b>Anti-diabetic</b>             | <ul style="list-style-type: none"> <li>• Maitake</li> <li>• Reishi</li> </ul>                                                  |
| <b>Anti-fibrolytic</b>           | <ul style="list-style-type: none"> <li>• Reishi</li> </ul>                                                                     |
| <b>Antioxidant</b>               | <ul style="list-style-type: none"> <li>• Reishi</li> <li>• Chaga</li> <li>• Maitake</li> <li>• Enokitake</li> </ul>            |

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Integrative Cardiology

*presented by*  
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DC, DABCI, DACBN, ND



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