

A Short Guide to a Long Life

Chapter Four: Food and Water

- Avoid soft drinks and other acidic drinks, particularly colas (which have an extremely acidic pH of 2.5).
- Replace coffee, which is also quite acidic, with less acidic beverages such as tea (particularly green tea).
- Drink one-half fluid ounce per pound of body weight of alkaline water (pH between 9.5 and 10) each day. A 140-pound person should drink about nine 8-ounce cups per day.
- In general, unfiltered tap water should not be drunk. Filtered tap water or ideally filtered, alkalinized water should be drunk instead.
- Purified alkaline water can be produced from tap water by using an alkalinizing water machine (see recommended products listing).

Chapter Five: Carbohydrates and the Glycemic Load

One of the principal recommendations is to *cut down sharply on high-glycemic-load carbohydrates*. Beyond this, the proportion of carbohydrates in the diet depends on your health condition.

Our “*low-carbohydrate group*” consists of five subgroups of people that should *cut down their carbohydrate consumption to no more than one sixth of their calories* and *virtually eliminate high-glycemic-load carbohydrates*. As an example, the maintenance calorie level for someone weighing 150 pounds who is moderately active is 2,250 calories. This would translate into a carbohydrate limit of 94 grams per day. The five subgroups of people are:

- People trying to lose weight.
- People with The Metabolic Syndrome (also known as “Syndrome X” -- see definition below).
- People with Type II diabetes.
- People with elevated risk factors for heart disease.
- People who have cancer, have had cancer, or have an elevated risk of cancer.

For this low-carbohydrate group, we recommend:

- Limit total carbohydrate consumption to less than one sixth of calories (see table below).
- Generally avoid grains and fruit juices.
- Eat very small quantities of low-glycemic index fruits, such as berries.
- Acceptable carbohydrates in limited quantities include legumes (bean, lentils) and nuts.
- Acceptable carbohydrates in larger quantities include low starch vegetables, particularly fresh and lightly cooked
 - Good low starch vegetables:
 - Kale, Swiss chard, collards, spinach
 - Dandelion greens, green and red cabbage, broccoli
 - Red and green leaf lettuce, romaine lettuce, endive
 - Chinese cabbage, bok choy, fennel, celery, cucumbers
 - Cauliflower, zucchini, Brussels sprouts
 - Green vegetables in general
- Use a starch blocker.

Maintenance Calorie Level and Recommended Carbohydrate Level for Low-

Carbohydrate Group

WEIGHT	SEDENTARY		MODERATELY ACTIVE		VERY ACTIVE	
	Total calories	Carb Grams	Total calories	Carb grams	Total calories	Carb Grams
90	1,170	49	1350	56	1620	67.5
100	1,300	54	1500	63	1800	75
110	1430	60	1650	69	1980	82.5
120	1560	65	1800	75	2160	90
130	1690	70	1950	81	2340	97.5
140	1820	76	2100	88	2520	105
150	1950	81	2250	94	2700	112.5
160	2080	87	2400	100	2880	120
170	2210	92	2550	106	3060	127.5
180	2340	98	2700	113	3240	135
190	2470	103	2850	119	3420	142.5
200	2600	108	3000	125	3600	150
210	2730	114	3150	131	3780	157.5
220	2860	119	3300	138	3960	165
230	2990	125	3450	144	4140	172.5
240	3120	130	3600	150	4320	180

People who are not in these five groups – the moderate carbohydrate group – should use the following recommendations: *cut down carbohydrates to no more than one third of total calories*, as well as *cut down sharply on high-glycemic-load carbohydrates*. As an example, the maintenance calorie level for someone weighing 150 pounds who is

moderately active is 2,250 calories. This would translate into a carbohydrate limit of 188 grams per day.

For the moderate carbohydrate group, we recommend:

- Cut down sharply on high-glycemic-load foods (foods containing non-trivial amounts of sugar and refined starch), including pastries, desserts of all kinds containing sugar and refined starch, breads, bagels, pasta, and high starch vegetables such as potatoes and rice.
- Limit total carbohydrate consumption to less than one third of calories (see table below).
- Eat limited amounts of whole grains.
- Consume limited quantities of fruit juice and fruits.
- Good carbohydrates to eat include legumes (beans, lentils) and nuts.
- Carbohydrates you can eat with relatively no restriction: low-starch vegetables (see list above).
- Use a starch blocker.

Maintenance Calorie Level and Recommended Carbohydrate Level for Moderate-

Carbohydrate Group

WEIGHT	SEDENTARY		MODERATELY ACTIVE		VERY ACTIVE	
	Total Calories	Carb grams	Total Calories	Carb grams	Total Calories	Carb grams
90	1170	98	1350	113	1620	135
100	1300	108	1500	125	1800	150
110	1430	119	1650	138	1980	165
120	1560	130	1800	150	2160	180

130	1690	141	1950	163	2340	195
140	1820	152	2100	175	2520	210
150	1950	163	2250	188	2700	225
160	2080	173	2400	200	2880	240
170	2210	184	2550	213	3060	255
180	2340	195	2700	225	3240	270
190	2470	220	2850	238	3420	285
200	2600	217	3000	250	3600	300
210	2730	228	3150	263	3780	315
220	2860	238	3300	275	3960	330
230	2990	249	3450	288	4140	345
240	3120	260	3600	300	4320	360

Tips for Reducing Carbohydrates in Your Diet

*Eat more fiber. Fiber is an important constituent of many carbohydrate foods and offers an array of health benefits. Soluble fiber such as pectin, arabinose, beta-glucan, and psyllium is found in legumes, fruits, root vegetables, oats, barley, and flax and lowers LDL-C (“bad”) cholesterol. Insoluble fiber such as the cellulose in celery improves functioning of the large intestine and may reduce colon cancer. Both forms of fiber add bulk and texture to your diet. Under labeling laws, fiber may be listed under carbohydrates, even though it is not digested and has no digestible calories. So in counting carbohydrates, you should subtract fiber grams from carbohydrate grams to

determine actual digestible carbohydrates. You can also reduce the calorie count by four times the number of fiber grams (the calorie count includes 4 calories for each gram of fiber).

*Be patient. It takes 1 to 2 weeks for carbohydrate cravings to go away when carbohydrates are significantly reduced in the diet, particularly when high-glycemic carbohydrates are cut or eliminated. It is almost impossible to reduce your weight and maintain an optimal weight without eliminating carbohydrate cravings in this manner.

*Use substitutes. Replace carbohydrate-rich foods with low-carbohydrate substitutes. There is an entire world of low carb substitutes for high-carb foods that you enjoy: breads, hot and cold cereals, frozen desserts, puddings, pastas, syrups, jams, and many others. See www.URLPLACEHOLDER.com for specific product suggestions and links. These products make adopting a low-carbohydrate diet relatively easy.

*Take it along. Bring some packets of stevia with you when dining away from home. You can whip up a low-carbohydrate, low-fat salad dressing by combining stevia with lemon juice and/or balsamic vinegar.

*Eat low-starch veggies to your heart's content. We suggest eating a broad variety of vegetables of as many colors as possible.

*Switch to fruits. Eat berries and small portions of other fruits for dessert.

*Eat slowly.

*Avoid highly processed foods, such as French fries and baked goods.

*Use a starch blocker to further reduce the carbohydrates actually digested by your body.

Chapter Six: Fat and Protein

We recommend restricting fat to 25 percent of calories, although virtually all of this fat should be “good fat.” (25 percent of calories means less than 12 percent of food weight because of fat’s higher caloric density (9 calories per gram versus 4 for protein and carbohydrates.)

More important than total fat consumption is the type of fat. Fat in the diet should come from the following sources:

- Nuts
- Fish high in EPA and DHA. Salmon is recommended due to its high level of EPA and DHA and relatively low level of mercury. Wild salmon is higher in EPA and DHA than farm-raised salmon.
- Extra virgin Olive oil
- Flaxseeds and naturally pressed flaxseed oil are transformed in the body into EPA and DHA. However, many people do not have the critical enzymes needed for this conversion, so consuming EPA and DHA directly is recommended.
- Vegetables (although found only in small amounts, vegetables have mostly healthful forms of fat)
- Tofu

Sources of Fat that can be eaten in small quantities:

Lean meats, especially lean white meat of chicken and turkey. Free-range poultry raised without hormones and antibiotics is preferable. Red meat should be eaten in very small quantities or not at all.

Forms of fat that should be avoided include:

- Saturated fat in fatty meat, butter, milk, and other animal products
- Commercial oils (use extra-virgin olive oil instead)
- Hydrogenated fats in margarine and shortening, which are high in trans-fatty acids. Note that almost all commercial bakery products use these forms of fat.

Recommendations for food preparation include:

- Avoid deep frying.
- Stir frying in healthy oil, such as extra virgin olive oil is acceptable. An even healthier way to stir fry is to first put water in the pan (a wok is recommended), then a small amount of a healthful oil (extra virgin olive oil), then cook briefly at a low to moderate temperature.

Supplementation with EPA and DHA (dosage) is recommended.

Cholesterol consumption in the diet should be limited to 1,000 mg per week.

Person with elevated risk factors for heart disease should limit cholesterol consumption to 600 mg per week.

For the moderate carbohydrate group, at least 35% of calories should come from protein. For the low carbohydrate group, at least 55% of calories should come from protein.

- Most of this protein should not come from animal sources (meat, whole eggs, dairy products) because it would be impossible to maintain the other recommendations, particularly regarding eating healthy fats.
- Most of your proteins should come from vegetables, which contain healthy proteins, very low glycemic-index carbohydrates, and small amounts of healthy fats.

- It is important to eat a variety of vegetables to get all of the amino acids in optimal levels, which are several times greater than the minimum levels needed to avoid deficiencies.
- Another source of high quality vegetable protein is soy protein, which is found in many products intended as substitutes for foods that are normally high in carbohydrates (such as pastries) or high in animal fat (such as burgers). Other sources of protein can include:
 - Egg whites (including egg substitutes which are 99% egg white)
 - Lean meats, particularly white meat of chicken and turkey

Chapter Seven: You Are What You Digest

- Chew your food thoroughly.
- Assess vitamin B₁₂ effectiveness by measuring levels of methylmalonic acid. Excessive levels of this metabolic intermediate indicate inadequate B12 effectiveness, which can be resolved through supplements of intrinsic factor as well as vitamin B₁₂ sublingual tablets or injections.
- Eat at least 25 grams of fiber per day, including at least 10 to 15 grams of insoluble fiber.
- Assess your metabolic type (on a scale from someone who thrives on a diet emphasizing animal protein to someone who thrives on a vegetarian diet). Start with your blood type (Type O tends more towards animal protein, type A tends more towards vegetarian foods, types B and AB are mixed). There is, however, only a weak correlation between blood type and metabolic type. The only reliable way to assess this is through your own experimentation.
- Assess the effectiveness and health of your digestive process. We recommend the following tests every 2-5 years:
 - Comprehensive digestive stool analysis (CDSA).

- Evaluation of hair samples for levels of nutrient minerals and heavy metal toxins.
 - Assess level of stomach acid by looking at the adequacy of mineral assimilation on hair mineral tests. Low stomach acid (hypochlorhydria) can be remedied through supplementation with Betaine hydrochloride.
 - Treat unhealthy gut bacteria through:
 - “Weed” using appropriate antifungal, antibacterial and antiparasitic supplements or medications
 - “Seed” healthy bacteria with multi-flora supplements, which contain lactobacillus and bifidobacteria.
 - “Feed” the healthy bacteria with FOS (fructo-oligosaccharides).
 - Evaluate food sensitivities and allergies.
- For persons with chronic gastrointestinal symptoms, the following tests are recommended in consultation with your health professional:
- The tests listed above for everyone.
 - Evaluation of the stool for parasites.
 - Evaluation of leaky gut syndrome, addressed below.
 - A breath test to assess lactose intolerance.
 - A breath test to assess bacterial overgrowth of the small intestine.
 - Blood tests for IgG antibodies to H. pylori, the primary cause of peptic ulcers, gastritis, and a contributing factor to gastric cancer.
- Diagnose Leaky Gut Syndrome through a urine test using lactulose and mannitol.
- Treating leaky gut syndrome includes:
- Adopt a healthy diet in accordance with our other recommendations.
 - Avoid harsh foods, including caffeine, alcohol, chemicals, and unnecessary or excessive medications, including NSAIDs.
 - Avoid toxins by eating organic foods.
 - Assess and treat possible overgrowth of yeast fungi or excessive levels of unhealthy bacteria in the intestinal tract.
 - Digestive enzymes can help to break down foods, reducing the strain on the digestive system.

- Fiber will move the intestinal chyme through more quickly.
 - Probiotics will help to seed healthy bacteria in the gut.
 - Helpful supplements for leaky gut syndrome include aloe vera, garlic, bioflavonoids, and antioxidant supplements.
 - Fructose-oliogasaccharides (FOS) is a special type of fiber supplement that is not digested and that provides nutrition for healthy gut bacteria. We recommend two to five grams per day.
- Irritable Bowel Syndrome (IBS) is a frequently diagnosed condition with a wide variety of uncomfortable gastrointestinal symptoms, including abdominal cramps and pain, gassiness, bloating, irregular bowel movements, diarrhea and/or constipation, feelings of incomplete evacuation from bowel movements, excessive passing of gas, nausea, heartburn, and excessive belching. Adopting the nutritional guidelines of Ray & Terry's Longevity Program is one important step towards resolving IBS and restoring overall GI health. Supplements that have been found to be very helpful in dramatically reducing IBS symptoms include:
- Enteric-coated peppermint oil.
 - The herb Iberis amara, also known as Clown's mustard.
 - A specific product that the authors have had success in recommending to resolve IBS symptoms is "Sea Cure," which contains amino acids derived from fish.
- Eat Organic Whole Foods:
- Whole foods are better than processed foods.
 - Living foods are better than dead foods.
 - Eat lots of fresh vegetables.
 - Food grown in "live" soil is better than food grown in the sterile soil of "agro-business."
 - Organic foods are best.
- Additional Dietary Principles:
- Drink tea (particularly green tea) rather than coffee.
 - Eat a variety of foods. Rotate your foods.

- Try eliminating wheat to see if improves your gastrointestinal functioning.
 Eat wheat only in moderate amounts.
 - Eat colorful vegetables.
 - Drink freshly squeezed vegetable juice.
 - Do not overcook vegetables. The ideal way to cook them is to lightly steam them.
 - Moderate consumption of alcohol can reduce risk of heart disease and stroke, but (obviously) avoid excessive use.
 - Eat breakfast, eat frequently.
 - Avoid unhealthy snacks.
 - Plan ahead for restaurants, parties, traveling. Bring helpful condiments with you.
 - “Everything in moderation, including moderation.” Be mindful of the slippery slope of discouragement from temporary lapses of discipline.
 - Avoid sugar (and all of its forms, such as sucrose, fructose, maltose) in packaged and commercial foods.
 - Another reason to avoid French fries and snack foods such as potato chips is the high level of acrylamide, a potent carcinogen.
- Foods to Avoid:
- White flour products (such as white bread, pastries, pasta)
 - Sugar (as a ubiquitous ingredient in packaged foods, see above)
 - Hydrogenated fats
 - Commercially prepared oils
 - Fried foods
 - Baked or fried breads and potatoes
 - Trans fats (margarine, Crisco, Kool Whip)
 - MSG (used in Chinese restaurants and in certain foods)
 - Artificial preservatives and chemicals
 - Aspartame (Equal, Nutrasweet, etc.) and Saccharin
 - Foods with a high glycemic index (pastries, cereals, breads, high starch vegetables)

- Tap water
 - Soft drinks
 - Added Iron
- Foods to Eat in Limited Quantities. These foods can be eaten in moderation, depending on your glycemic category and metabolic type:
 - Whole grains
 - Fruit
 - Lean meats, particularly white poultry meat without the skin
 - Wheat
 - Caffeine
 - Alcohol
- Generally Good Foods to Eat:
 - Legumes
 - Low-starch vegetables, particularly fresh and lightly cooked
 - Vegetable proteins
 - Foods rich in Omega-3 fats
 - Nuts
 - Avocado
 - Flaxseed
 - Fish (although mercury is a concern)
 - Eat smaller fish: anchovies, sardines are very good
 - Salmon is ideal: high in omega-3 fats and relatively low in mercury (but farm raised salmon is much lower in omega-3 fats)
 - Avoid larger fish because these are more concentrated in mercury: tuna, swordfish, sailfish, shark
- Even when following a healthy diet, supplements are needed to provide optimal levels of nutrients that are not possible to get from food and to address specific problems.

Chapter Eight: Change Your Weight for Life in One Day

- Basic Procedure for our “Change Your Weight for Life in One Day” program:
 - Step One: Determine your body frame size from Table 1 in chapter 8
 - Step Two: Determine your optimal weight range from Table 2 in chapter 8. Set your optimal weight to the low end of the range. If your weight falls below this level, increase your calorie consumption to maintain this optimal weight.
 - Step Three: Determine and adopt the maintenance calorie level for your **optimal** weight and exercise level (which should be at least moderately active), based on Table 3 of chapter 8. This will result in gradual weight loss, which will automatically taper off as you approach your optimal weight. You only need to make this one change.
- As you approach your optimal weight, assess the important issue of body fat, which should be in the range of 12 to 20% for men and 18 to 26% for women, although we recommend you stay on the lean side of these ranges. Use the tables on body fat (see section on this web site) to determine your body fat percentage. Alternatively, you can use a scale that shows body fat percentage.
- Do not make weight loss your primary goal. Rather, adopt a healthy pattern of eating with a sustainable level of calories and approach your optimal weight gradually.
- Exercise is an important component of losing weight and a healthy life style. We recommend at least 300 calories of exercise per day (see chapter 22 on Exercise).
- Dietary recommendations:
 - Avoid high-glycemic-load foods. If you are trying to lose weight, eat less than one sixth of your calories as carbohydrates (not including fiber) per

day. Losing weight and keeping it off is virtually impossible without reducing the glycemic load and carbohydrate level of your diet.

- Reducing fat is also important because of the high caloric density of fat.
 - Emphasize foods that are low in caloric density (that is, low in calories but high in weight). Vegetables (except for high-glycemic-load veggies such as potatoes) are the ideal category of food for losing weight and attaining optimal nutrition.
 - Consume at least 25 grams of fiber per day, including at least 10 grams of insoluble fiber.
- Caloric restriction (CR) extends longevity in a wide range of animals and researchers believe it is also likely to extend human longevity. To practice a moderate form of CR, a man whose optimal weight is 150 pounds should eat about 1800 calories per day and a woman whose optimal weight is 125 pounds should eat about 1500 calories per day (adjust these figures based on your own optimal weight). Depending on your activity level, these are 10 to 33% lower than the tables of maintenance calories recommended above.
- A starch blocker, such as Precose or Glyset, prescription medications, may be considered as an adjunct to a low glycemic-load, low carbohydrate diet by persons with Metabolic Syndrome or Type II diabetes.
- We recommend Stevia as an alternative zero-calorie sweetener.
- Use caution in using fat blockers, such as the prescription medication Xenical or the natural substance Chitosan, because they will block the absorption of fat-soluble vitamins (such as E) and other nutrients as well as the healthy fats themselves. Do not use fat blockers within three hours (before or after) taking fat-soluble vitamins and supplements.

Chapter Nine – The Problem with Sugar (and Insulin)

Testing

- Have your fasting blood glucose and insulin level checked
- If you have any symptoms of TMS (the metabolic syndrome), schedule a 2-hour glucose-insulin tolerance test with your physician
- TMS symptoms include the following:
 - waist circumference more than 40 inches in men or more than 35 inches in women
 - serum triglyceride (blood fats) level greater than 150 mg/dL (deciliter or tenth of a liter)
 - “good” cholesterol (HDL-C) less than 40 mg/dL in men or less than 50 mg/dL in women
 - elevated blood pressure -- higher than 135/85
 - fasting blood glucose over 110 mg/dL

Diet

- Eliminate sugar and sugary foods from your diet almost completely
- Follow our modified Japanese and Mediterranean diet models
- Eat foods with a low glycemic load -- (see
www.lifelonghealth.us/mhc_home/pdf_docs/GLYCEMIC_INDEX.pdf for a full list)

Supplementation and Medications for TMS and T2DM

- Chromium 200 mcg 2-3 times daily (with meals) for TMS. Diabetics should take 300 micrograms 3 times a day
- Vanadyl sulfate 7.5 mg 1-2 times a day
- Coenzyme Q10 60 - 100 mg twice a day
- Carnosine 500 mg 1-2 times a day
- Magnesium 200-400 mg a day
- Conjugated Linoleic Acid (CLA) 500-1500 mg twice a day
- L-Carnitine 600 mg 2 or 3 times a day
- Vitamin E 400-800 IU per day
- Vitamin C 2000 mg/ day
- Biotin 3 mg 3 times a day; may combat insulin resistance when administered jointly with chromium picolinate
- Arginine 3 grams 3 times a day; helps reduce insulin resistance
- Glutamine 500- 1000 mg; helps eliminate carbohydrate cravings, particularly during the transition period of reducing consumption of sweets and other high G-I foods
- DHEA 15-25 milligrams 1-2 times/ day
- N-acetyl-L-cysteine (NAC) 500 mg twice a day

Chapter Eleven: Genomics: The Promise of Genomics

Predictive Genomics testing is available today and can provide previously unknowable genetic information personalized to each individual. A hallmark of Ray &

Terry's Longevity Program is reprogramming your genetics by aggressive application of a *personalized* lifestyle program. The best way to *personalize* your program is to obtain some direct information about the genes you possess.

We recommend that you:

- Select appropriate genomics panels you want to screen for yourself and your family after discussing this with your physician.
- If your current physician does not perform this testing yet, see if a doctor listed on the ACAM web Site (www.acam.org) can provide this testing. As another alternative, genomics profiles are performed at Terry's longevity clinic in Denver (www.fmiclinic.com). Specimens for most genomics panels can be collected at home using a sample of saliva.
- A reference laboratory that performs several comprehensive genomics panels is Genova Diagnostics. For further information, see their website www.genovations.com. They may also be able to provide you with the name of a healthcare provider in your area who offers this testing.

They have the following genomics panels currently available. **This information is taken from www.genovations.com/profiles.html.**

"CardioGenomic™Profile

Identifies genetic single nucleotide polymorphisms associated with increased risk of developing atherosclerosis, hypertension, and coronary artery disease. Risk factors include methylation defects, hyper-coagulation syndromes, cholesterol regulation defects, inflammation, general risk markers and cardio-protective

markers.

OsteoGenomic™Profile

Identifies genetic single nucleotide polymorphisms associated with increased risk of developing osteopenia and osteoporosis. Risk factors include collagen synthesis, calcium metabolism, vitamin D3 activity, parathyroid hormone action, osteoclastic activity, and chronic inflammation.

DetoxiGenomic™Profile

Identifies genetic single nucleotide polymorphisms associated with increased risk of developing detoxification defects especially with increased exposure to xenobiotics and other toxins. Risk factors include altered cytochrome P-450 activity in phase 1 detoxification, impaired glutathione conjugation and acetylation in phase 2 reactions, altered catecholamine methylation and increased oxidative stress. Detoxification defects have been associated with increased risk for certain cancers, chronic fatigue, multiple chemical sensitivity, and alcoholism.

ImmunoGenomic™Profile

Identifies genetic single nucleotide polymorphisms associated with increased risk of developing defects in immune competence and surveillance. Risk factors include altered interleukin production and activity within the body and increased production of other cytokines like tissue necrosis factor alpha that may lead to conditions characterized by chronically up-regulated inflammatory response. Immunologic polymorphisms have been associated with increased risk of asthma, atopy, osteopenia, heart disease, and infectious diseases.”

Chapter Twelve: Inflammation -- The Latest "Smoking Gun"

Testing

- Get a fasting hs-CRP
- If at high risk of heart disease, Alzheimer's, or cancer (because of family history or lifestyle), consider genomic testing for inflammatory markers and essential fatty acid testing

Treatment

- Decrease insulin sensitivity and excess silent inflammation by eating a lower-glycemic-load diet
- Avoid excessive amounts of foods rich in inflammatory arachidonic acid (egg yolks, shellfish, red meat)
- Increase dietary anti-inflammatory foods and spices, such as cold water fish, green tea, onion, garlic, turmeric, ginger, rosemary
- Decrease exposure to sources of inflammation (dietary, infectious)
- Practice good dental hygiene
- Employ EFA supplementation with EPA/DHA and GLA
- Patients at high risk for cardiovascular or Alzheimer's disease should consider low dose aspirin therapy (81 mg/ day).

Chapter Thirteen: Methylation -- Critically Important to Your Health

Defective methylation pathways are found in a significant percentage of the Caucasian and Asian population due to a common genetic defect. It is found in individuals of African descent, but at a much lower rate. Simple testing is available, although not typically covered by insurance. Aggressive supplementation can reduce or even eliminate the serious risks presented by this potentially dangerous polymorphism.

Testing

- Schedule a fasting homocysteine determination. If your fasting homocysteine is over 7.5, get an additional methionine challenge (Homocysteine Stress Test.)
- If you find that you have an elevated homocysteine level (over 7.5), implement nutritional supplementation then recheck your level. Increase nutrients until your level is less than 7.5.
- Consider genomics testing for the MTHFR 677 C→T polymorphism, especially if you are Caucasian or Asian.

Treatment

- If you have elevated homocysteine, decrease consumption of red meat and poultry, which are high in methionine.
- Employ aggressive nutritional supplementation as needed:
 - Vitamin B12 100-2,000 mcg
 - Folic Acid 800-10,000 mcg

- Vitamin B6 (ideally P5P) 50-100 mg
- Vitamin B2 50-100 mg
- Betaine 100-3,000 mg
- Zinc 15-50 mg
- Magnesium 400-800 mg
- TMG 500-1,500 mg

If your homocysteine level does not fall below 7.5, despite taking upper-limit amounts of the above nutrients, consider vitamin B12 injections in a dose of 1000 mcg a week until it drops. The frequency of injections can then be decreased per your doctor's suggestions.

Chapter Fourteen: Cleaning Up the Mess -- Toxins and Detoxification

Testing

Heavy Metal Toxins

- Perform a hair minerals screening test.

Detoxification Capacity

- Perform a Comprehensive Detoxification Profile.
- Consider testing for genomic detoxification abnormalities

Treatment

Air Pollution

- Don't smoke and avoid places where people do smoke.

- Try to live in a less polluted part of the country or in a less polluted part of the city.
- Use air filtration systems in your house and place of work.

Water Pollution

- Use a purifying, alkalinizing water filter for drinking and cooking uses.
- Install a filter to remove chlorine and fluoride from your other household water.

Food Pollution

- Favor plant-based foods over animal products.
- Trim obvious fat from red meat and remove the skin from poultry
- Eat organic foods whenever possible and soak fruits and vegetables for a few minutes in water mixed with a commercial produce cleanser(available at health food stores).

Electromagnetic Pollution

- Minimize exposure to hair dryers, electric shavers, etc.
- Sit at least ten feet away from big screen TVs.
- Do not sleep under electric blankets or on a heated waterbed.
- Reduce your total cell phone usage and use “hands free” connection with air tube, ferrite choke, and external antenna.

Heavy Metal Pollution

- Limit fish and seafood to those with lower mercury content.
- Do not use aluminum cookware or aluminum foil. Replace aluminum containing anti-perspirants with non-aluminum containing products (available at natural food stores).
- Consider oral or injectible chelation therapy.

Misformed Proteins

- Assist energy production by taking nutrients that assist in the formation of ATP, such as coenzyme Q10, NADH and carnitine.
- Include mineral and vitamin co-factors, such as the B vitamins, magnesium and manganese for mitochondrial resuscitation.
- Remove heavy metals toxins by chelating agents.

Strengthening Your Detoxification Capacity

- Diet
 - Garlic, onions, lemon, rosemary and green tea can help strengthen the liver's enzymatic functions and assist with elimination of heavy metals.
 - Cruciferous vegetables such as broccoli, cauliflower, kale, cabbage, Brussels sprouts and bok choy have detoxification properties.

- Cilantro is a natural heavy metal chelator.
- Nutritional supplements include
 - N-Acetylcysteine (NAC), which boosts levels of glutathione, one of the liver's most important Phase II detoxifiers.
 - Milk thistle (silymarin) and alpha lipoic acid give the liver a helping hand.
 - Adequate levels of vitamin C, many of the B vitamins, magnesium and selenium, which are critical for optimal detoxification enzyme function.
- Drink adequate water and avoid constipation.
- Vigorous aerobic exercise and saunas help remove toxins through sweat.

Chapter Fifteen: The Real Cause of Heart Disease and How to Prevent It

The primary cause of heart attacks is soft, relatively small “vulnerable” plaque that lies inside the artery vessel wall, not the hard and relatively large calcified plaque growing on the inside surface of coronary arteries, as previously thought. The good news is that this vulnerable plaque is more easily reversed than calcified plaque.

Bypass and angioplasty surgeries do not reduce this primary cause of heart disease, which is why these procedures do not reduce subsequent heart attacks and deaths.

A UF CT Heart Scan with calcium score measures the amount of hard, calcified plaque in the coronary arteries. Although calcified plaque is not the direct cause of most heart attacks, this score is important information because calcified plaque growth tends to

accelerate (rapidly increases). There is a relationship between the growth rate of calcified plaque and the amount of vulnerable plaque. So the higher your calcium score, the more vulnerable plaque you are likely to be creating unless you take the preventive measures recommended here.

Rather than interpret the calcium score as an absolute number, you should compare your score to other people who are your age and gender. If your score is higher than the average shown in the table below, then it is likely that your rate of plaque creation is high, and you should give a high priority lowering your risk factors for heart disease. If your score is higher than 75 percent of the people your age and gender, then you should give this an urgent priority.

TABLE: CALCIUM SCORES (AVERAGE AND 75 PERCENTILE)

Men

Age	Average	75th Percentile
40-45	2	11
46-50	3	36
51-55	15	110
56-60	54	229
61-65	117	386
66-70	166	538
70+	350	844

Women

Age	Average	75th Percentile
40-45	0.1	1
46-50	0.1	2
51-55	1	6
56-60	1	22
61-65	3	68
66-70	25	148
70+	51	231

Following are the major risk factors for heart disease, including the optimal range and the risk factor range for each category.

The Major Risk Factors for Heart Disease

Add one major Risk Factor for Each Category that is in the Risk Factor Range

If you have three or more major risk factors, we recommend

- a full set of blood tests (cholesterol, HDL, Triglycerides, hs-CRP, Homocysteine)
- UF CT Heart Scan with Calcium Score
- Exercise Stress Test

Risk Factor Category	Optimal Range	Risk Factor Range
Genetic Inheritance	No parents or siblings with heart disease	Male parent had heart attack before age 55

		Female parent had heart attack before age 65
Gender and Age	Age under 30	Male 45 or older Female 55 or older
Smoking	You never smoked	You now smoke 1 or more packs / day You smoked in the past for 10 years or more
Weight	95% of ideal weight (see table 2 in chapter 8)	20% or more over ideal weight
Cholesterol and Triglycerides	Total Cholesterol 160- 180 LDL: 80 (if you have less than 3 major risk factors) 70 or less (if you have 3 or more major risk factors) HDL over 60 Ratio of Total cholesterol to HDL under 2.5 Triglycerides under 100	Total Cholesterol over 200 Or LDL over 130 Or HDL under 40 Or Ratio of total cholesterol to HDL over 4

Homocysteine	7.5 or less	10.0 or greater
hs-CRP	1.3 or less	over 5.0
Fasting Glucose and Insulin	Glucose 60-80 Insulin 2-3	Glucose over 120 Or Insulin over 10
Blood Pressure	Systolic 120 or less Diastolic 80 or less	Systolic 140 or higher Diastolic 90 or higher
Stress	Not type A personality with high level of anger Not type D	Type A with high level of anger Or Type D
Exercise	Active	Sedentary

Major Risk Factors:

- Genetics. Be aware of your genetic tendencies by reviewing the health history of your parents and get a genomics panel of cardiovascular genetic tests.
- Smoking. Don't smoke and avoid second-hand smoke.
- Weight. Attain your optimal weight, as we discussed in chapter 8.

➤ Elevated Cholesterol, LDL and Triglyceride Levels and Diminished HDL Levels.

The following represents optimal values for key lipid levels:

Blood Test	Standard Reference Value	"Optimal" Level
Fibrinogen (mg/dL)	under 460	under 300
C-reactive protein (mg/L)	under 5	under 1.3
Homocysteine (umol/L)	under 15	under 7.5
Ferritin (mg/dL)	under 180	under 100
Cholesterol (mg/dL)	100 - 199	160-180
LDL (mg/dL)	0 - 129	LDL: 80 (if you have less than 3 major risk factors) 70 or less (if you have 3 or more major risk factors)

HDL (mg/dL)	40 - 59	60 or more
Cholesterol : HDL ratio	2.5 – 4.0	under 2.5
Triglycerides	0 - 149	under 100

Recommendations to improve lipid levels:

- Adopt a healthy diet by following nutritional recommendations in chapters 4 through 9. Most importantly, sharply reduce saturated fat. If cholesterol and/or LDL levels are elevated, restrict dietary cholesterol to 100 mg a day or less.
- Supplement program:

Round One: We recommend that you start with this first round of supplementation to improve lipid levels:

Supplement	Amount per Dose	Times per Day	Total Dose per Day
Policosanol	10 mg	2	20 mg
Gugulipid	500 mg	2	1,000 mg

Vitamin E	400 mg	2	800 mg
Garlic	900 mg	3	2,700 mg
Curcumin	900 mg	1 to 2	900 to 1,800 mg
Niacin*	100 to 500 mg	2	200 to 1,000 mg
Soluble fiber**	4 to 6 grams	2 to 3	8 to 18 grams
Soy protein extract	1 ½ teaspoons (3 grams)	2	3 teaspoons (6 grams)
Green Tea Extract	500 to 1,000 mg	2	1,000 to 2,000 mg

* We recommend inositol hexanicotinate, which is a flush-free niacin (avoids a red face). Dosages of up to 3,000 mg per day are often used, although we recommend starting with dosages closer to 200 mg per day.

** Soluble fiber, such as pectin, guar gum, or psyllium, is recommended, especially before meals that are high in fat. If you take the prescription drugs nitrofurantoin or digitalis, do not take soluble fiber.

Round Two: After implementing round one and testing after two months, if levels are still not optimal, we suggest you add the following and then test again after another two months:

Supplement	Amount per Dose	Times per Day	Total Dose per Day
Plant Sterols	1,800 mg	2	3,600 mg

Round Three: If the natural supplements above fail to get your cholesterol, LDL, HDL and triglyceride levels to an ideal range, you and your physician may wish to consider enzyme HMG-CoA reductase inhibitors, known as “statin” drugs.

It is vital to take a Co Q10 supplement when taking statin drugs, because these medications deplete Co Q10 levels. Recommended dosage is 50 to 100 mg, twice a day.

It is important to note that lipid drugs have toxic effects on the liver, so your physician will want to monitor the health of your liver through blood tests that measure key liver enzymes.

A recent and particularly effective statin drug is atorvastatin, known as “Lipitor.” Unlike other lipid drugs, Lipitor is approved as a treatment to reduce triglycerides in addition to improving cholesterol levels. Lipitor can reduce LDL by 40 to 60 percent and triglycerides by 20 to 40%. It also boosts HDL by 5 to 10 percent.

Elevated Homocysteine Levels. We recommend keeping homocysteine levels below 7.5. Our program for lowering homocysteine level is in chapter 13.

Elevated Levels of high-sensitivity C-Reactive Protein (hs-CRP). We recommend achieving a hs-CRP under 1.3. Our program for lowering hs-CRP is in chapter 12.

Metabolic Syndrome (Syndrome X) and Type II Diabetes. Our recommendation: have your fasting glucose and insulin levels checked and follow the guidelines in chapter 8.

Hypertension. Optimal blood pressure is under 120 over 80. If your blood pressure is over this level, we recommend starting with a nutritional and supplement program and using prescription drugs only if that fails. The first step is to adopt our nutritional recommendations and attain your optimal weight. Determine if you have metabolic syndrome or type II diabetes and follow our program in chapter 9. These steps, especially adopting a low-carbohydrate, very-low-glycemic-index diet, are often adequate by themselves to resolve hypertension.

Supplements helpful in resolving hypertension include the following:

Supplement	Amount per Dose	Times per Day	Total Dose per Day
Vitamin C	1,000 mg	2	2,000 mg
Vitamin E	400 mg	2	800 mg
Coenzyme Q10	100 mg	3	300 mg
Fish Oil (400 mg EPA and 300 mg DHA)	2 to 3	3	6 to 9 capsules

in each capsule)	capsules		
Alpha Lipoic Acid (ALA) *	250 mg	2	500 mg
L-Arginine **	2 to 3 grams	3	6 to 9 grams
Garlic	900 mg	3	2,700 mg
Calcium	500 mg	1 to 2	500 to 1,000 mg
Magnesium	400 mg	2	800 mg
Potassium	100 mg	1	100 mg
Policosanol ***	10 mg	2	20 mg
Green Tea Extract	500 to 1,000 mg	2	1,000 to 2,000 mg

* ALA is an important supplement in preventing and treating metabolic syndrome (Syndrome X) as discussed in chapter 9.

** L-Arginine has many additional benefits in improving vessel health.

*** As we discuss above, Policosanol is a very effective supplement in improving cholesterol and related lipid levels.

If these recommendations prove insufficient and prescription drugs are considered, angiotensin II antagonists such as Cozaar or Hyzaar appear to be safer and more effective than short-acting calcium channel-blockers. Diuretics and beta-blockers appear to increase insulin resistance, which is counter productive and increases the risk of developing metabolic syndrome and type II diabetes.

Stress. The continual self-imposed stress associated with a type A personality results in higher levels of adrenaline, which worsens inflammation. These people with short tempers, continually getting angry, is the personality type with higher risk. However, the “type D” personality, with a lack of social connectedness and inability to express emotion, also increases heart disease risk. Our program for managing stress is described in chapter 23.

Lack of Exercise. Adequate levels of exercise contribute significantly to reducing all of the controllable risk factors, including improving insulin sensitivity, contributing to weight loss, and reducing blood pressure, stress and inflammation. Our exercise program is described in chapter 22.

➤ Secondary risk factors include the following. See the main text of chapter 15 for details and recommendations.

- Sleep Apnea
- High Levels of Fibrinogen
- Male Pattern Baldness
- High Levels of Iron in the Blood

- Gum Disease
- Hypothyroidism

Noninvasive Diagnosis and Treatment

If you have less than three known major risk factors (see table above), we recommend the following blood tests at least every five years:

- Total cholesterol
- LDL-C
- HDL-C
- Triglycerides
- Homocysteine
- C-Reactive Protein
- Fasting glucose
- Hemoglobin A1C

These results of these tests may add one or more risk factors.

If you have three or more risk factors, we recommend:

- A UF CT Heart scan with calcium score to measure the total amount of calcified plaque. You should ask for the amount of calcium score associated with each lesion, since the distribution of calcified plaque also indicates risk.
- An exercise stress test.

- There is a new generation of UF CT scanners and MRI (magnetic resonance imaging) machines capable of imaging the subtle bulges associated with vulnerable plaque. These systems look promising for assessing the true source of heart-attack risk.

In addition to the noninvasive remedial procedures involving diet and supplements described above, an ingenious method for reducing angina pain and improving overall cardiac health is enhanced external_counterpulsation (EECP).

Invasive Diagnosis and Treatment

Invasive diagnostic and treatment procedures for heart disease are actually the ninth-ranking cause of death in the U.S. In addition, there are many side effects to these procedures. These include accelerating formation of both vulnerable plaque and calcified plaque.

Angiography: We strongly recommend that patients avail themselves of the growing arsenal of noninvasive diagnostic procedures that can accomplish as much or more as conventional angiography. Noninvasive UF CT heart scans and MRI scans can be more informative, particularly since angiograms are unable to detect vulnerable plaque.

Bypass Surgery: We believe that the vast majority (at least 90 percent) of bypass surgeries are not needed and that patients would achieve more effective reversal of coronary plaque, both vulnerable and calcified, through the noninvasive means described in this book.

Balloon angioplasty surgery may be effective in temporarily reducing angina pain, but studies have not reported significant reductions in subsequent heart attacks or deaths. This invasive surgery also has a high potential to dislodge or tear calcified plaque, causing it to become unstable. This encourages inflammation and vulnerable plaque formation. It can also damage the delicate lining of coronary arteries, which also encourages the formation of soft plaque.

The great advantage of noninvasive methods of stopping and reversing both vulnerable and calcified plaque is that they truly heal the source of the problem. The invasive forms of treatment tend to be crude palliatives (pain suppressants) with many serious complications and risks and with little if any improvement in outcomes. With sufficient diligence and attention, almost everyone can avoid heart disease, as well as invasive treatments and the enormous suffering and death toll that this disease engenders.

Chapter Sixteen: The Prevention and Early Detection of Cancer

Testing (Early Detection)

- Consider obtaining a baseline DR-70, which is a non-specific blood test for many types of cancer.
- Consult with your physician regarding risk-specific screening scans.
- Consider performing a genomics profile of your detoxification and immune systems including such markers as GSTM1.

Prevention

- Diet and nutrition
 - Follow the “5-to-10-A-Day Program”: 5-7 servings of vegetables and 0-3 servings of fruit daily. Start the day with a glass of fresh-squeezed organic vegetable juice.
 - Incorporate aspects of the Mediterranean and Japanese diets such as olive oil and tomato products and soy-based foods, fish and green tea
 - Avoid sugar and high glycemic-index carbohydrate foods
- Lifestyle modification
 - Exercise regularly
 - Get adequate exposure to sunlight
 - Eat organically grown foods whenever possible
 - Avoid being overweight
 - Control stress
 - Don't smoke
- Chemoprevention
 - Vitamin C – take 2 grams/day
 - Folic Acid – take 800 mcg-10,000 mcg/ day
 - Selenium – take 200 mcg 1-3 times/ day
 - Coenzyme Q 10 – take 60-200 mg / day

- Curcumin -- take 900 mg/ day
- Melatonin – take 0.5-3 mg at bedtime
- EPA/DHA – take 1000-3000 mg EPA/ 700-2000 mg DHA/ day
- Beta-carotene – cigarette smokers should not take

Chapter Eighteen: Your Brain: the Power of Thinking . . . and of Ideas

➤ “Use it or Lose it” – Keep your brain active throughout life

- Keep reading, take adult continuing education classes
- Engage in intellectual projects
- Express your creative or artistic urges
- Learn to play a new musical instrument or get better at one you already play
- Learn to paint, sculpt or sing
- Take up a new hobby
- Stay connected to others. Make new friends and continue to maintain your longstanding interpersonal relationships.

➤ Avoid Substance Abuse

➤ Lifestyle Choices for Brain Health

- Stimulating mental activity throughout life helps preserve brain function.
- Proper diet, a physically active lifestyle, stress management, adequate sleep and targeted nutritional supplementation are all important

- “Smart” Nutrients – The following nutrients have been shown to assist in maintenance of brain function:
 - Vinpocetine - 10 mgs twice a day
 - Phosphatidylserine - 100 mgs twice a day for one month, then decrease to 100 mg a day
 - Acetyl-l-carnitine - 500-1000 mg twice a day
 - Gingko biloba - 80 to 120 mg twice a day
 - Pregneneolone - 5-25 mg once a day. Men must monitor PSA levels when taking pregneneolone just like when taking testosterone or DHEA
 - EPA/DHA - 1000-3000 mg EPA/ 700-2000 mg DHA/ day
 - Phosphatidylcholine - 900 mg once or twice a day.

- **The Power of Ideas**

- Realize that no matter what quandaries you face – business problems, health issues, relationship difficulties, as well as the great scientific, social and cultural challenges of our time – there is an idea that can enable you to prevail.
 - You can find that idea.

Chapter Nineteen: Hormones of Aging, Hormones of Youth

- **Hormones of Youth: Hormones of Aging Ratio**

- Perform a salivary “Adrenal Stress Index”

➤ **Decreasing Catabolic Hormones of Aging**

- DHEA supplementation (see recommended dosages below)
- Herbs such as natural licorice or ashwaganda
- Lifestyle changes including:
 - Normalization of blood sugar swings by switching to a lower-glycemic-index diet
 - Stress reduction
 - Regular physical exercise
 - Adequate sleep.

➤ **Increasing Anabolic Hormones of Youth**

- DHEA (Testing and Replacement)
 - Before implementing DHEA supplementation, check your DHEA-S (DHEA-sulfate) level and then re-check it six or eight weeks after you begin supplementation to make sure you achieve the desired level. Men should check their PSA level at the same time.
 - Try to achieve a maximum serum DHEA-S level of about 250 for women and 300 for men.
 - Men should start with 15 - 25 mg of DHEA per day and women with 5-10 mg per day and increase as needed to achieve these levels.
- **Growth Hormone**
 - Have an IGF-1 level checked. Your physician can tell what an optimal level for you would be based on your age and sex.

- The following diet and lifestyle choices can affect GH levels:
 - Avoid sugar and simple carbohydrate foods
 - Consume a protein-dominant diet
 - Get adequate deep sleep
 - Perform anaerobic exercise such as weight lifting
 - Take an amino acid “secretagogue” such as 2 grams of arginine and 2 grams of glutamine at bedtime to start. Ornithine and glycine can be added if needed.
 - DHEA supplementation is an inexpensive way to raise GH levels.

- **Melatonin Testing and Replacement**

- No specific testing is usually done for healthy people who wish to try melatonin supplementation.
- For most healthy people who have no sleep problems, begin with 0.1 mg about a half hour before bed. The dose can be increased to 0.5-1.0 mg, but more is usually not needed. Many people find a 0.5 mg sublingual tablet works well.
- For individuals with trouble falling asleep, a fast-acting or under-the-tongue formulation is recommended. Start with a dose of three to five milligrams of a sublingual preparation and increase to 10 milligrams if needed.

- If you wake up frequently throughout the night, try timed-release melatonin. Note, however, that with time-released melatonin, you may be tired in the morning.

Chapter Twenty: Other Hormones of Youth: Sex Hormones

Sex-Hormone Testing & Treatment Recommendations: Women

Estrogen

- When checking levels of female hormones, particularly in menopause, all three types of estrogen (estrone, estriol and estradiol) should be checked individually.
- If the decision is made to proceed with ERT, use bio-identical estrogen in the form of Bi-Est (E2 and E3) or Tri-Est (E1, E2, and E3) from a compounding pharmacy. If your doctor is unfamiliar or uncomfortable with using compounded products, he or she can write a prescription for Estrace, which is bio-identical estradiol (E2).
- Bio-identical estrogen has a short half-life, so, ideally, should be taken twice a day, about every 12 hours.
- Follow up by rechecking blood levels of estrogen until a proper level is achieved.
- To assess for breast cancer risk, fractionated estrogens (2OHE1 and 16 α OHE1) should also be measured with a goal of a 2:16 ratio greater than 1.
- For menopausal symptoms, increased consumption of soy products and cruciferous vegetables is recommended. Black cohosh supplementation can be tried as well.

Progesterone

- Progesterone levels should be measured as part of routine hormone screening.
Postmenopausal women can have their level checked at any time. Premenopausal women should be screened on days 17-20 of their cycle.
- If levels are suboptimal, bio-identical hormone replacement with either bio-identical micronized oral progesterone or progesterone cream should be used.
Dosage should be under a physician's recommendations.

Testosterone

- Levels of free and total testosterone should be measured as part of a full hormone evaluation.
- If levels are suboptimal, testosterone replacement therapy can be done with topical testosterone cream 1-5 mg daily

Sex-Hormone Testing & Treatment Recommendations: Men

Estrogen

- Estrogen levels should be checked and excess levels treated with aromatase inhibitors such as I3C, chrysin and Arimidex (see below).
- Supplementation with estrogen is not recommended for men.
- In the rare case where estrogen levels are too low, some increase is possible with DHEA.

Progesterone

Men should not use progesterone unless directed to do by their physicians

Testosterone

- Before beginning testosterone replacement, hormonal evaluation which includes both free and total testosterone levels, DHT, estradiol, and a PSA test for prostate cancer.
- If the decision is made to implement testosterone therapy, a topical (skin) bio-identical testosterone formulation is recommended. Oral testosterone formulations can cause liver problems. Typical doses prescribed are 25-50 mg of bio-identical transdermal testosterone once or twice daily. Follow the directions for application.
- Saw palmetto 160 mg twice daily will help prevent conversion of testosterone into DHT and should be taken.
- I3C 200 mg twice daily and chrysin 1000-3000 mg daily can help prevent conversion of testosterone into estrogen and should be taken as indicated. The

prescription drug Arimidex should be used if estrogen levels are still high despite doing the above.

- Men on androgen replacement therapy (both testosterone and DHEA) must undergo regular prostate cancer screening with digital rectal examination and blood tests for PSA.
- Blood levels of testosterone, estradiol and hematocrit should be checked periodically to ensure adequacy of dosage and that too much testosterone is not being converted into estradiol. Too much testosterone can cause the blood to become too thick, so your doctor will monitor this by checking your “hematocrit” as well.

Chapter Twenty-one: Aggressive Supplementation

Universal Supplements (needed by everyone)¹

Nutrient	RDA (Recommended Dietary Allowance)	ONA (Optimal Nutritional Allowance)
Vitamin A (IU)	2660 (females) 3330 (males)	5000
Vitamin D (IU)	200-600	600-2000
Vitamin E (IU)	22-33	400-800
Vitamin K (mcg)	90(females) 120 (males)	90-120
B1 (Thiamine) (mg)	1.1 (females) 1.2 (males)	10-200

B2 (Riboflavin) (mg)	1.1 (females) 1.3 (males)	10-100
B3 (Niacin) (mg)	14 (females) 16 (males)	20-100
B6 (Pyridoxine) (mg)	1.3-1.5 (females) 1.3-1.7 (males)	50-100
B12(Cobalamin) (mcg)	2.4	10-25
Folic Acid (mcg)	400	400-800
Vitamin C (mg)	75 (females) 90 (males)	500-2000
Calcium (mg)	1000-1200	1000-1500
Magnesium (mg)	320 (females) 420 (males)	400-600
Iron(mg)	15-18 (females) pre-menopause 8 (females)post-menopause 8 (males)	15 (females) pre-menopause 0 (females) post-menopause 0 (males)
Zinc (mg)	12 (females) 15 (males)	15-30
Copper (mg)	0.9	0.5-4
Selenium (mcg)	55	100-250
Manganese (mg)	1.8 (females) 2.3 (males)	2-5
Chromium (mcg)	20-25 (females) 30-35 (males)	120-200

Omega-3 EFAs (mg)	1100 (females) 1600 (males)	EPA 1000-3000 mg DHA 700-2000 mg
-------------------	--------------------------------	-------------------------------------

Super-nutrient Supplements (helpful for almost everyone)

Supplement	Amount
Coenzyme Q10	30-100 mg 2x a day
Grape seed extract	50-100 mg 2x a day
Alpha lipoic acid	50-100 mg 2x a day
Carnosine	250-500 mg 2-3 x a day
Resveratrol	200 mg 2 x a day

Specific Supplements (recommended for specific conditions)

Supplement	Indication	Daily Dose
Lutein	Eye health	6 mg
I3C	Breast, prostate cancer prevention	200 mg
Lycopene	Prevents prostate disease	10-30 mg
Saw palmetto	Prevents prostate disease	320 mg
Garlic extract	Heart, blood pressure	1600 mg
Arginine	Heart, blood pressure	6000-9000 mg
Vinpocetine	Memory	10-20 mg

Chapter Twenty-Two: Keep Moving: The Power of Exercise

- The benefits of exercise include:
 - Reduces the risk of heart disease.
 - Reduces the risk of high blood pressure.
 - Increases the strength of ligaments and tendons.
 - Enhances sexual desire, performance and satisfaction.
 - Helps in the management of stress and alleviates depression.
 - Improves the quality of sleep.
 - Reduces the risk of developing colon, prostate and breast cancer.
 - Helps alleviate low back pain.
 - Improves physical appearance.
 - Improves self-esteem.
 - Decreases resting heart rate.
 - Promotes relaxation.
 - Helps relieve constipation.
 - Helps to retard bone loss, reducing risk of developing osteoporosis.
 - Allows more energy and vigor to meet the demands of daily life.
- The mainstay of an exercise program is regular aerobic exercise, which raises heart and breathing rates. Examples of aerobic exercise include walking, swimming, cycling, rowing, and cross-country skiing.
- Benefits of aerobic exercise include:
 - Lowering the risk of cardiovascular disease, cancer, and other diseases.

- Weight loss.
 - Reduced hypertension.
 - Improved sleep.
 - Better mood.
 - Reduced triglyceride levels.
 - Boosted levels of HDL, the good cholesterol.
- During aerobic exercise, you should be at your training heart rate, which is between 50 and 75 percent of your maximum heart rate, which you can estimate as 220 minus your age.
- The ideal aerobic exercise is walking, because you can do it anywhere.
- Before you start a regular exercise program, consult your health professional, who can advise you on any special considerations regarding your physical condition and health. This is essential if you have indications of heart disease or other serious illness, you are middle-aged or older, or you haven't been physically active.
- You may need an exercise stress test if you are over 40; have two or more coronary risk factors such as family history, cigarette smoking, hypertension, hypercholesterolemia, diabetes, or sedentary lifestyle; or have had abnormal results at a physical. A stress test is an electrocardiogram (ECG) administered for ten to fifteen minutes while you exercise on a treadmill or stationary bicycle.
- About 10 to 20 percent of stress tests give false positives and 20 percent to 40 percent yield false negatives.

- Start any exercise program slowly. The objective is to exercise on a regular basis and build this activity into a predictable routine. It is important not to overdo.
- Get the right walking shoes. We recommend the equivalent of walking three miles per day or more, five or more days a week, although even four days per week of regular aerobic exercise is of significant benefit. Once you are fit, expect each session to require 45-50 minutes.
- The five phases of aerobic exercise are stretching, warm-up, exercise, cool-down, and stretching. Plan to walk in your training heart rate for 30 to 40 minutes each session. In general, you will need to walk at least four miles per hour to achieve your training heart rate.
- To intensify your workout, swing your arms, walk uphill, carry one- or two-pound hand weights, stair-climb, or alternate moderate pace with brisk striding. Don't use hand weights if you have heart disease, hypertension, or back problems. Don't swing the weights.
- Jogging is an excellent aerobic activity, but it does place cumulative stress on the feet, ankles, lower leg, and knees. A large percentage of runners develop injuries.
- Swimming and water aerobics are ideal forms of exercise for everyone, especially the elderly and others who suffer from muscle or joint infirmities and injuries.
- Bicycling is both aerobic and low-impact if the proper form is used. When cycling outdoors, be sure to use a safety helmet.
- Tedium is a major reason people fail to maintain their exercise programs. If you find the right exercise for you, it can be an enjoyable part of your routine.

Walking can be a refreshing way to tour your neighborhood. Other ways to avoid

tedium include exercising with friends, listening to music, or watching television.

You may also wish to vary your exercise routine.

- Don't exercise within 30 to 45 minutes after eating. It is also not ideal to exercise late at night right before going to sleep.
- Avoid pain in your exercise program. If you are too fatigued to carry on a conversation, you are working too hard and should slow down.
- Keep a written record of your progress.
- Use common sense if you are not feeling well. If you miss a week or more of your routine, restart cautiously.
- For the weight-training component of your exercise program, start with weight machines. Have a trainer at your gym give you an introduction to the weight-training circuit.
- As you start a weight training program, remember these tips:
 - Work out two to three times a week on alternate days.
 - Ensure that you know and use proper lifting technique. Don't compromise form for a higher weight.
 - Remember to breathe.
 - Perform at least one set on each major muscle group. Work the large muscle groups first, such as the chest and back, and then the smaller muscles, such as the biceps.
 - Use careful, slow, controlled movements.
 - Include 8-12 repetitions per set.
 - Vary your program and increase weights as you progress.

- Stretching makes you flexible, which means it increases the range of motion in your joints.
- There are many benefits to flexibility training, including better physical performance, better circulation, improved posture, stress relief, and enhanced coordination and balance.
- The ACSM guidelines for setting up a flexibility program include:
 - Warm up first to make the muscles supple and easier to stretch.
 - Focus on the major muscle groups (front and back of the legs, shoulders, chest, and so on).
 - Perform the stretches at least three times a week.
 - Stretch muscles slowly until you feel a slight pull, not pain.
 - Hold each stretch for 10 to 30 seconds. Don't bounce.
 - Start slowly and work up.

Chapter Twenty-Three: Stress and Balance

- Chronic activation of the “fight or flight” syndrome is a major contributor to heart disease, type II diabetes, stroke, cancer, rheumatoid arthritis, depression, and accelerated aging.
- Of all the aspects that make up the classic type A pattern, the only ones that appear to be related to an increased risk of heart disease are those involving anger, cynicism, and hostility.

- A premenopausal woman's relatively high level of estrogen acts with the hormone oxytocin to encourage the healing behaviors of "tend and befriend," rather than fight or flight.
- Not all characteristics of the type A personality are detrimental. Being eager to achieve a set of goals because of the four C's – challenge, commitment, curiosity, and creativity – are supportive of health.
- Physical symptoms accompanying the failure to deal constructively with stress include high blood pressure, headaches, rapid heartbeat, aches and pains, muscle tension, and gastrointestinal discomfort. Behavioral indications include difficulty sleeping; compulsive behavior, including compulsive use of food, drugs, alcohol, sex, or gambling; problems in concentration; accident proneness; and social withdrawal. Emotional signs include nightmares, crying spells, feelings of worthlessness, excessive or compulsive worrying, mood swings, restlessness, and anxiety. Spiritual signals include a sense of emptiness, loss of life's meaning, excessive confusion, and doubt about one's direction in life.
- False Stress Relievers include:
 - Compulsive eating.
 - Use of tobacco.
 - Abuse of alcohol, although moderate use of alcohol can temporarily relieve stress and is supportive of health.
 - Abuse of caffeine. Rather than coffee, we recommend tea, preferably green tea, which has about one quarter of the caffeine of coffee, and also

contains threonine, which promotes natural relaxation. Green tea also contains powerful antioxidants.

- Abuse of benzodiazepines.
 - Abuse of illegal drugs, including cocaine and heroin.
- Ray and Terry's Twelve Point Program for Managing Stress Constructively:
- Follow the Short Guide to a Long Life nutritional guidelines.

Avoid tobacco, benzodiazepines, cocaine, and other addictive drugs. Avoid abuse of alcohol and caffeine.
 - Follow the exercise guidelines in chapter 22.
 - Get adequate sleep. Our sleep program:
 - Allow adequate time for sleep, give this a high priority.
 - Seven to eight hours per night is typically optimal, although this varies from person to person.
 - The nutrition and exercise guidelines in this book and the stress guidelines in this chapter are helpful to attain a good night's sleep.
 - Maintain a regular routine, especially when it comes to your night-time routine.
 - If you have difficulty sleeping, cut down on caffeine, and try cutting it out altogether. Don't consume caffeine after midday.
 - Useful supplements include threonine, GABA (not Kava) (500 to 1,000 mg), and Melatonin (200 to 1,000 mcg sublingual recommended).
 - Strive for balance between the poles of work, family/friends, and self.

- Give attention to time management. Write down your priorities for the following week, follow up to see how you actually spend your time.
- Take regular vacations.
- Talk with someone – express your true feelings – on a regular basis.
- Listen – with empathy – to others.
- Have regular massages.
- Have a life partner. Ingredients of a successful, long-term marriage include:
 - Keep in mind that in disputes and arguments, you can't win – it's either win-win, or lose-lose.
 - Be like the wise bamboo, and bend.
 - Keep your partner "special."
 - Devote time to your relationship. You won't have the quality times without devoting the quantity.
 - Have a "life" outside your marriage.
 - Healthy flirting is okay.
 - Strive to learn new things together.
 - Don't stop having sex.
- Evoke the relaxation response on a regular basis: the opposite of the fight or flight response. Methods that have been documented to elicit the relaxation response include:
 - Yoga, including yogic meditation, stretching and breathing control.
 - Biofeedback.

- Visualization.
 - Meditation (see description in chapter 23 for details on one recommended technique).
- Ideas for living more fully:
- Be aware of the seasons.
 - Get some sun each day (about five to ten minutes).
 - Practice lucid dreaming (see our lucid dreaming program in chapter 23).
 - Seek quiet environments.
 - Seek out beauty.
 - Don't be unduly attached to things (consider how many wars are fought over rocks and sand).
 - Don't be unduly concerned with what other people think of you (except that you may be able to learn something useful about yourself by listening to valid criticism and taking it to heart).
 - Give criticism very sparingly (only if you really need to help someone).
 - Keep learning.
 - Keep challenging yourself.
 - Be optimistic.
 - Be grateful (and express it).
 - Give yourself to someone.
 - Have integrity.

- Take responsibility for your well-being.
- Keep a journal (it helps put concerns into perspective).
- Never retire, but do change the nature of your work from time to time.
- Keep an open mind.
- Most importantly, practice the four C's: Challenge, Commitment, Curiosity, and Creativity.

¹ Institute of Medicine, Food and Nutrition Board. 2000. *Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids*. National Academies Press: Washington D.C.

See also http://www.fiu.edu/~nutreldr/Resources/Resources/DRIs/DRI_Table_%20One_A.pdf.