



Food is Medicine:
An Update on Dietary and Supplemental
Interventions for Health

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Connecticut Academy of Family Physicians
Scientific Symposium
October 23, 2013

Integrative Medicine
at Saint Francis

Quiet attention as you begin to heal.



>60% US adults are overweight

40% are obese

We spend \$120 billion on diagnosis
and treatment of diabetes,
hypertension and obesity annually

What we put into our bodies



matters.

"I'm Lovin' it!"

Peter Travers, Rolling Stone

"Tasty and outrageous!"
*Dean Goldstein
Entertainment Weekly*

"Two thumbs up!"
David Karger

SUPER SIZE ME

A Film of Epic Portions

WINNER BEST DOCUMENTARY (2004) **AMERICAN FILM INSTITUTE** WINNER BEST DOCUMENTARY (2004) **AMERICAN FILM INSTITUTE** WINNER BEST DOCUMENTARY (2004) **AMERICAN FILM INSTITUTE** WINNER BEST DOCUMENTARY (2004) **AMERICAN FILM INSTITUTE**

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- Gained 24.5 lb
 - “McLove” handles
- Lack of focus
- Depressed
- Headaches
- Impotent
- Fatty liver
- Elevated blood pressure
- Skyrocketing cholesterol

Pereira MA. Lancet. 2005 Jan 1-7;365(9453):36-42.

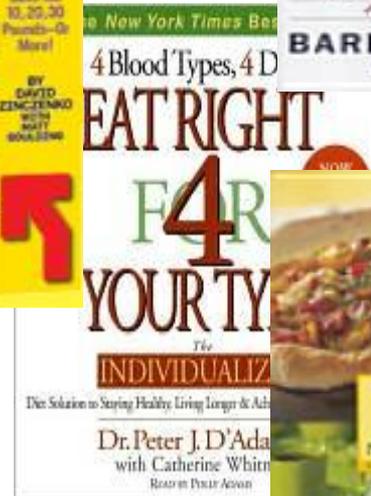
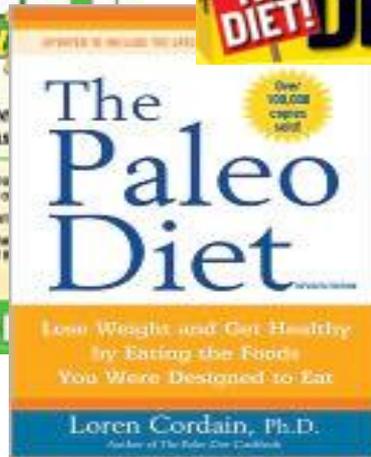
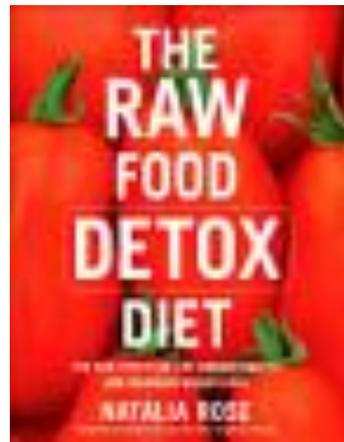
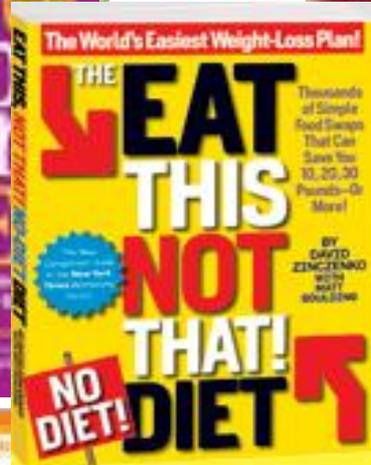
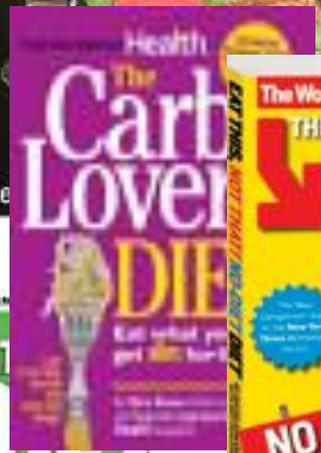
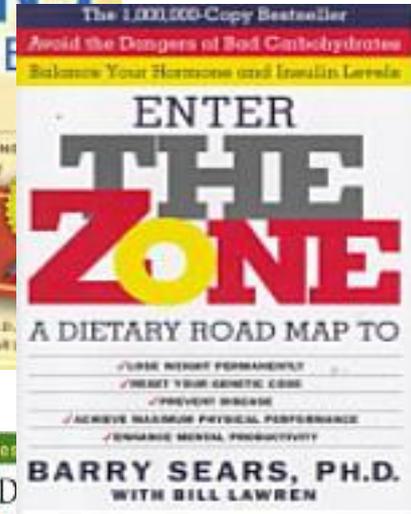
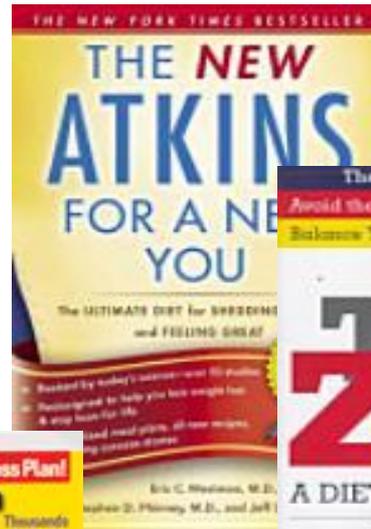
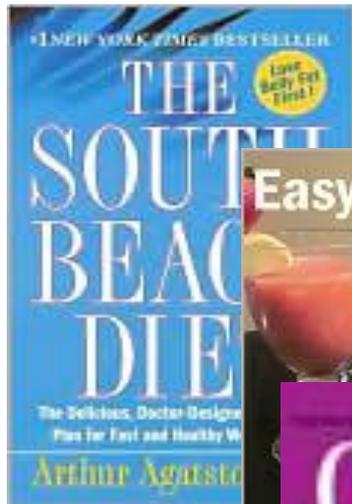
Fast-food habits, weight gain, and insulin resistance (the CARDIA study): 15-year prospective analysis.



Biosphere2



- Artificial, materially-closed ecological system in Oracle, Arizona
- First closed mission – Sept. 26, 1991 to Sept. 26, 1993
- Low-calorie, nutrient-dense diet
- Lost an average of 16% of their pre-entry body weight
- Stabilized and regained some weight during their second year
- Biospherians' metabolism became **more efficient** at extracting nutrients from their food as an adaptation to the low-calorie, high nutrient diet





diet: (dáiit) n. the food and drink normally taken in by an individual or a group.



SAD: Standard American Diet

EUROPE

France

Monaco

Slovenia

Croatia

Bosnia & Herzegovina

Montenegro

Albania

Italy

Corsica

Spain

Balearic Sea

Balearic Islands

Sardinia

Adriatic Sea

Sicily

Malta

Crete

Aegean Sea

Sea of Crete

Crete

Bosporus Strait

Dardanelles Strait

Turkey

Cyprus

Lebanon

Israel

Libya

Tunisia

Algeria

Morocco

AFRICA

Suez Canal

Egypt

Lower incidence of heart disease

Lower incidence of stroke

Lower incidence of obesity

Countries that border the Mediterranean Sea



Mediterranean Diet: Lyon Heart Study





- 1988-1992
- 300 patients who had their first heart attack
- Randomized into 2 groups - “prudent diet” or Mediterranean diet
- Plan was to follow them for 5 years





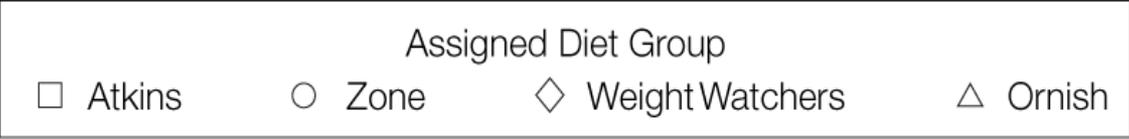
- **50-70% reduction in deaths**
- **Effect seen in 2 months**
- **Effect NOT related to cholesterol levels**
- **NOT related to blood pressure**
- **Discontinued after 2 years with the results from the intermediate review**
- **Majority still following the diet 4 years later**

de Lorgeril et. al. *Circulation* 1999 Feb 16;99(6):779-85.

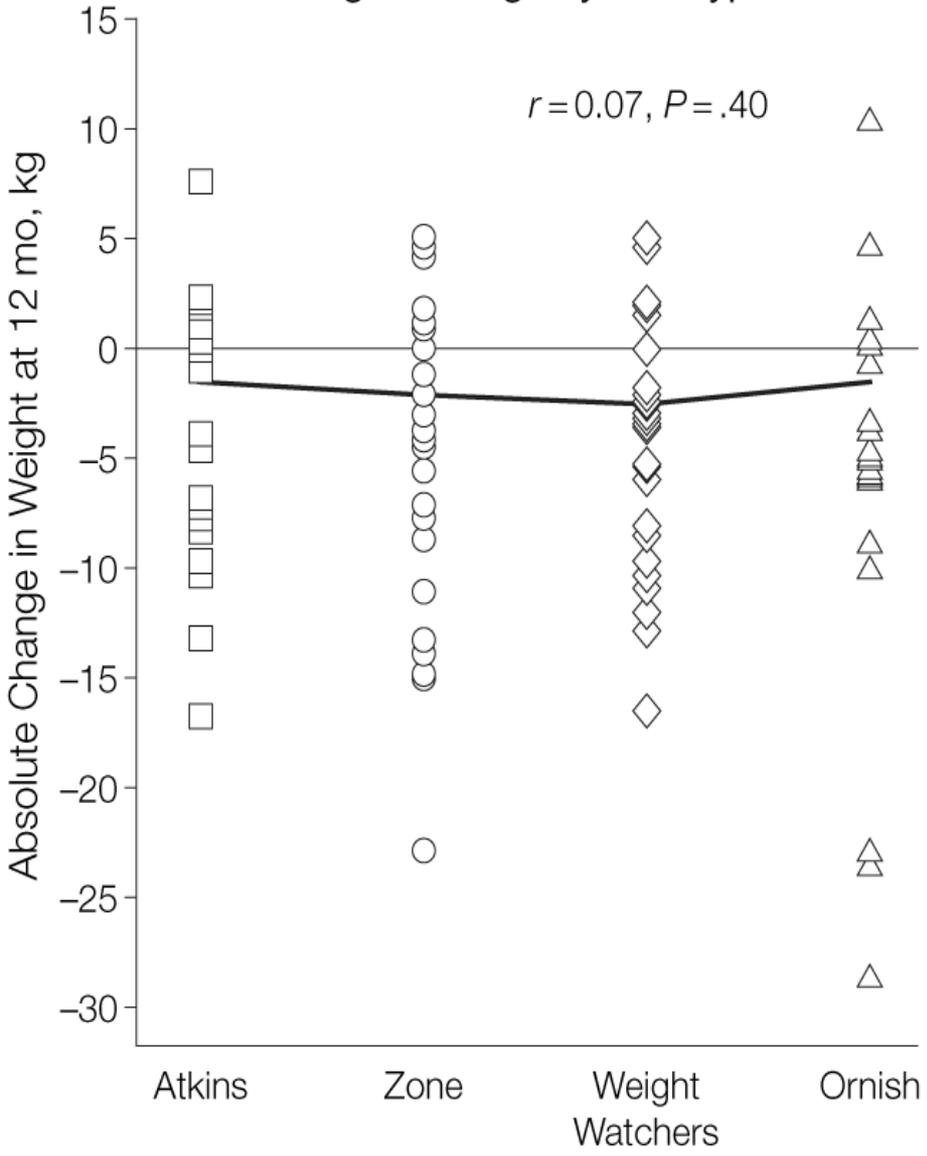


- Compared Atkins, Ornish, Weight Watchers and Zone diets
- Overweight adults over age 22-72
- Over 12 months 4.8-7.3 lb weight loss
- Overall moderately reduced risk factors
- Dietary adherence was low

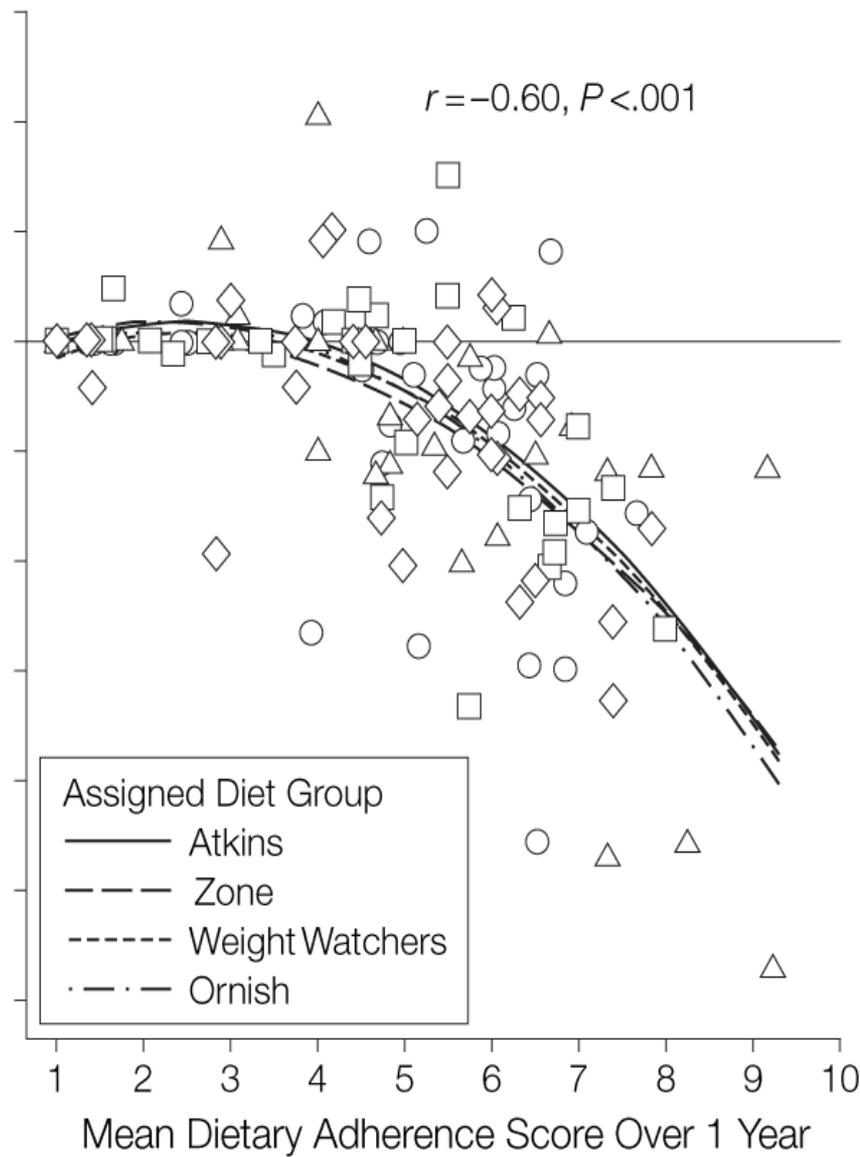
Dansinger et.al. JAMA 2005 5;293(1):43-53.



Weight Change by Diet Type



Weight Change by Dietary Adherence



DASH diet:



Dietary Approaches to Stop Hypertension



DASH diet

- 90% US adults consume >2300 mg salt daily – avg 3400 mg/day
- 98% consume >1500 mg /day
- Sodium trial sponsored by NIH
- Individuals with stage 1 hypertension and blood pressure in the upper portion of the normal range (Appel, 1997)



DASH diet

- High in fruits, vegetables, and low-fat dairy foods, and low in saturated fat, total fat, and cholesterol
- Restricted salt intake to <2300 mg



DASH diet

- Best response with blood pressure in the moderately high range and prehypertension
- For severe hypertension improved response to medication, lowered blood pressure
- Reductions in BP were also sustained on follow-up at 12 months (Ard, 2004)



DASH diet

- Increase in dietary sodium over subsequent 12 mo - sustained reductions in SBP
- Patients continued DASH recommendations after study completion (Elmer, 2006)
- Continued a greater fruit and vegetable intake than prior to study participation



IOM - New evidence on sodium

- Significant variability in quality of studies
- + relationship  sodium and CVD
- Some effect persisted even with adj of BP
- Subgroup HF – greater risk w <1840 mg/day
- DM, CKD, pre existing CVD – no benefit and possible adverse health outcomes 1500-2300 mg

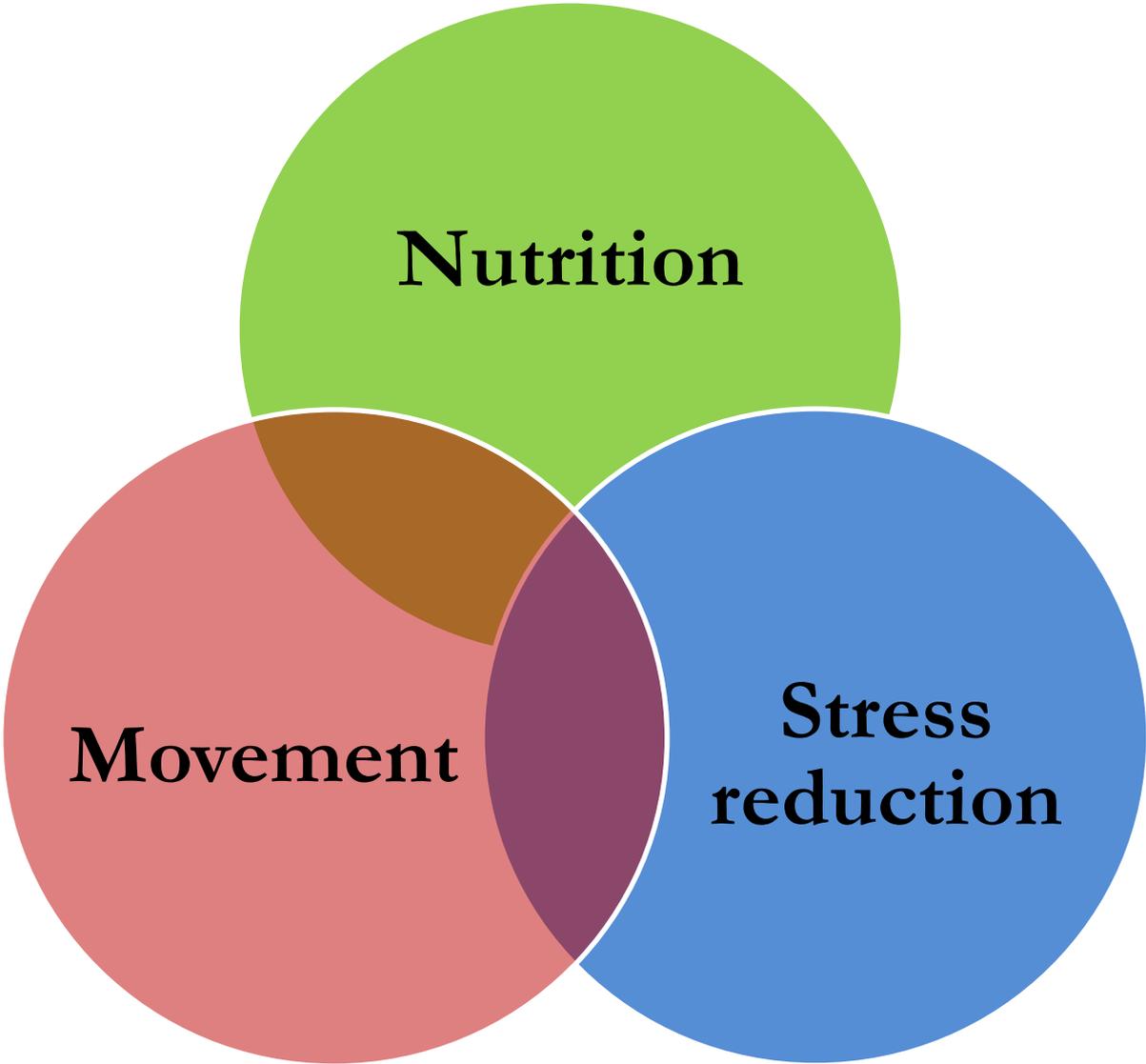


Confusing...what do we tell patients?



Chronic low grade systemic inflammation is now considered a primary culprit in the pathogenesis of

- Cardiovascular disease
- Metabolic syndrome
- Type 2 diabetes
- Hypertension
- Other inflammatory and autoimmune medical conditions
- Some cancers



Nutrition

Movement

**Stress
reduction**



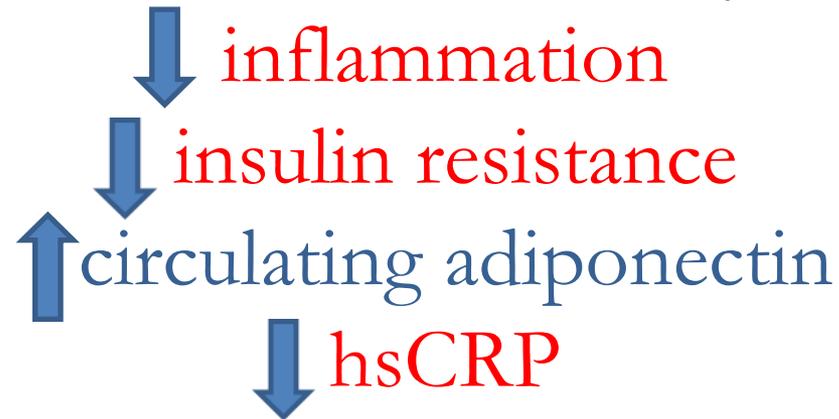
Bioinflammatory markers

- high sensitivity C-reactive protein (hsCRP)
- serum amyloid A
- interleukin-6
- adiponectin

Associated with predicting risk for disease, and are influenced by modifiable factors such as diet, body weight, and physical activity.



Substituting consumption of whole grains for refined grains and eating a low glycemic varied diet such as the DASH or Mediterranean-style diet shows:





In 2010, we spent approximately
\$125 billion on cancer care

How can we reduce our risk for cancer?

Fiber

Soluble fiber can be found in foods such as oatbran, barley, nuts, seeds, beans, lentils, fruits (citrus, apples), strawberries and many vegetables



Soluble fiber sources



Insoluble fiber is found in foods such as whole wheat and whole grain products, vegetables, and wheat bran



Insoluble fiber sources





- Minimizes constipation and ↑ stool bulk
 - dilutes potential carcinogens
 - decreases transit time
- Binds to potential carcinogens, facilitating excretion
- Helps ↓ excess energy intake by incr satiety
- Slows glucose absorption from the small bowel
 - modulates insulin response



- Inhibits cholesterol absorption from the small intestine
 - ↓ serum cholesterol levels
- Promotes favorable environment for colonic flora by lowering fecal pH and providing fuel for colonocytes
 - positively affects immune function



World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR)

- Probable protective association between fiber intake and colorectal cancer and esophageal cancer (WCRF/AICR, 2007)
- High fiber diet helps maintain gastrointestinal health, which in turn may influence cancer incidence and progression (Rock, 2004; Bidoli, 2010)



The Standard American Diet (SAD) provides 6-15 g fiber daily.

The US RDA for fiber
Women 25 g
Men 38 g

Cruciferous Vegetables





- Rich sources of sulfur-containing compounds known as glucosinolates
- Chopping or chewing results in bioactive glucosinolate hydrolysis products, such as isothiocyanates and indole-3-carbinol (I3C)
- I3C inhibits the development of cancer in animals (when given with a carcinogen)
- I3C enhances the development of cancer in animals when administered after a carcinogen



Breast Cancer

- Cohort of 3000 survivors
- Higher intake of CVs and total vegetables in women taking tamoxifen
- ↓ new or recurrent breast cancer events by as much as **52%** (Thomson, 2010)
- Effect was not present for non-tamoxifen users.
- More research necessary
- Epidemiological studies suggest that adults should aim for at least five weekly servings of cruciferous vegetables



- ✓ More fruits and vegetables – at least one with every meal
- ✓ Less processed food
- ✓ Increased fiber
- ✓ Smaller plate, taller glass
- ✓ Record what you eat
- ✓ Use supplements only to fill in gaps

Nutritional Supplements





Good for you
vitamin D
& fish oil.

Supplements and nutrients to complement multivitamins by helping to fill specific needs.

12.99

8.94

22.49

22.49

22.00



Folate and B Vitamins

- Elevated total circulating homocysteine (tHcy) levels - risk factor for CAD
- Folegard and Folyx (folic acid, and Vitamins B6 and B12) have been used to lower homocysteine
- No trials have shown **prevention** of cardiovascular disease with lowering homocysteine levels



Cochrane Reviews

“We found no evidence that homocysteine-lowering interventions, in the form of supplements of vitamins B6, B9 or B12 given alone or in combination, at any dosage compared with placebo or standard care, prevents myocardial infarction, stroke, or reduces total mortality in participants at risk or with established cardiovascular disease.”

B-complex vitamin therapy for preventing cardiovascular events, Martí-Carvajal AJ, Solà I, Lathyris D, Salanti G Published Online: October 7, 2009



Vitamin A

- Usually in the form of beta carotene
- Pro-vitamin that converts to Vitamin A
- Anti-inflammatory effects
- Some evidence that a diet rich in beta-carotene may reduce the risk of breast cancer in premenopausal women (5-7 fruits/veg daily)



- Associated with a slight increase in angina pectoris and in all-cause and cardiovascular mortality
- Increase in lung cancers in male smokers

The Alpha-Tocopherol, Beta Carotene Cancer Prevention Study Group,
1994

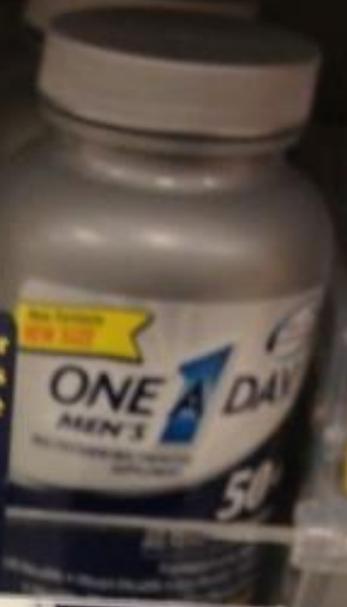
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Formulated to Support:*

- Cell Health
- Heart Health
- Healthy Blood Pressure††
- Eye Health
- Immunity
- Physical Energy

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MEN'S

MULTIVITAMIN/MULTIMINERAL
SUPPLEMENT

MORE OF 7
ANTIOXIDANTS!

50+

HEALTHY ADVANCE



advertised
\$4

7.99 7.99

Directions: Adults: One tablet daily, with food.

Supplement Facts

Serving Size: One tablet

	Amount Per Serving	% Daily Value
Vitamin A (20% as beta-carotene)	3500 IU	70%
Vitamin C	120 mg	200%
Vitamin D (as Vitamin D3)	700 IU	175%
Vitamin E	25.5 IU	85%
Vitamin K	20 mcg	25%
Thiamin (B1)	4.5 mg	300%
Riboflavin (B2)	3.4 mg	200%

	Amount Per Serving	% Daily Value
Niacin	20 mg	100%
Vitamin B6	6 mg	300%
Folic Acid	400 mcg	100%
Vitamin B12	25 mcg	417%
Biotin	30 mcg	10%
Pantothenic Acid	15 mg	150%
Calcium (elemental)	120 mg	12%
Iron	0 mg	0%
Iodine	150 mcg	100%

	Amount Per Serving	% Daily Value
Magnesium	110 mg	28%
Zinc	24 mg	160%
Selenium	117 mcg	167%
Copper	2.2 mg	110%
Manganese	4.2 mg	210%
Chromium	180 mcg	150%
Molybdenum	90 mcg	120%
Lycopene	370 mcg	*

*Daily Value not established.

INGREDIENTS: Calcium Carbonate, Magnesium Oxide, Microcrystalline Cellulose, Ascorbic Acid, Croscarmellose Sodium, Zinc Oxide, Gelatin, dl-Alpha-Tocopheryl Acetate, Hydroxypropyl Methylcellulose; Less than 2% of: Beta-Carotene, Biotin, Brewer's Yeast, Cholecalciferol, Chromium Chloride, Cupric Oxide, Cyanocobalamin, D-Calcium Pantothenate, Dicalcium Phosphate, FD&C Blue #1 Lake, FD&C Blue #2 Lake, Folic Acid, Lycopene, Maltodextrin, Manganese Sulfate, Niacinamide, Phytonadione, Polyethylene Glycol, Potassium Iodide, Pyridoxine Hydrochloride, Riboflavin, Silicon Dioxide, Sodium Molybdate, Sodium Selenate, Soybean Oil, Starch, Stearic Acid, Thiamine Mononitrate, Titanium Dioxide (color), Vitamin A Acetate.

A COMPLETE MULTIVITAMIN WITH MORE OF WHAT MATTERS TO MEN 50+
...to support your body as you age, but did you know that cells are a major factor in the aging process?
...multivitamin to help address many of a man's health concerns
...help support your cells.*



Supplement Facts

Serving Size 1 Softgel

Amount Per Serving	%Daily Value	
Vitamin A	8,000 IU	160%
(from Fish Liver Oil and Retinyl Palmitate)		

Other Ingredients: Soybean Oil, Gelatin, Glycerin, Mixed Tocopherols.

Contains fish (anchovy, bonito, herring, mackerel, menhaden, sand lance, sardine, smelt, tuna, jack) ingredients.

No yeast, wheat, gluten, milk or milk derivatives, lactose, sugar, preservatives, artificial color, artificial flavor, sodium.

Laboratory tested to meet strict quality control standards for potency, purity and disintegration.

WARNING: If you are pregnant, nursing or taking any medications, consult your doctor before use. Discontinue use and consult your doctor if any adverse reactions occur.

These statements have not been evaluated by the Food and Drug Administration.

IMMUNE SUPPORT

This formula with Vitamin A helps support your well-being. Vitamin A is essential for healthy skin and is important for immune system health.

Directions: Take 1 softgel daily, preferably with a meal. Discuss the supplement you take with your doctor.

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vitamin A
8,000 iu

helps support eye, skin and immune system health



250 SOFTGELS
DIETARY SUPPLEMENT



Vitamin E

- Epidemiological data suggest Vit E may prevent CVD
- Slight increased risk of heart failure
- Non significant risk reduction of CVD event in healthy women aged >45
- 24% reduction in CV death in healthy women
- Data do not support supplementation

JAMA. 2005 Mar 16;293(11):1338-47 and JAMA. 2005 Jul 6;294(1):56-65.



Vitamin D

- 3600 papers published on Vitamin D in 2012
- Adequate levels of vitamin D [25(OH)D > 30 ng/ml] have been shown to decrease
 - hip fractures by 16%
 - non-vertebral fractures by 20%
 - falls in patients older than 65 years by 19%



Vitamin D

- Multiple extraskeletal benefits including effects on the cardiovascular and immune systems
- Multiple trials show  vitamin D levels  CVD mortality
- Primarily affect the action of immunoregulatory cytokines which allow for a reduction in the inflammatory response



- Clinical evidence suggests a ↓ risk for tuberculosis, seasonal influenza, common cold
- Incidence of multiple sclerosis is 1-2 cases/100,00 near the equator and 200 cases/100,000 latitudes higher than 50°N



- Same seasonal variation has been seen in the risk of developing type I diabetes in children
- Adequate vitamin D stores have been shown to reduce all cancer risk for postmenopausal women and are currently the focus of many clinical trials

Zipitis CS, Akobeng AK. Vitamin D supplementation in early childhood and risk of type 1 diabetes: a systematic and met-analysis. *Arch Dis Child* 2008;93:512-517.



IOM has recommended

- 600 international units (IU) ages 1 to 70
- 800 IU per day for those aged 71 and older (an increase from the 400-600 IU/day previously recommended for adults at midlife and older)

Deficiency	<20 ng/ml (50 nmol/L)
Insufficiency	20-30 ng/ml (50-75 nmol/L)
Sufficiency	30-88 ng/ml (75-220 nmol/L)
Toxicity	88-125 ng/ml (>220 nmol/L)



Skip the mega-doses of supplements

Consider an anti-inflammatory diet

United States Pharmacopeia

Independent verification of supplements





Myfitnesspal.com



EWG's 2012 Dirty Dozen Plus

Shoppers Guide to Pesticides in Produce™

Buy these organic

● Domestic
● Imported

- Apples
- Bell Peppers
- Blueberries**
- Celery
- Cucumbers
- Grapes
- Lettuce
- Nectarines**
- Peaches
- Potatoes
- Spinach
- Strawberries
- Plus**
- Green Beans
- Kale/Greens

Pesticides residues of special concern. Questions? foodnews.org

EWG's 2012 Clean Fifteen

foodnews.org

Shoppers Guide to Pesticides in Produce™

Lowest in pesticides

- Asparagus
- Avocado
- Cabbage
- Cantaloupe**
- Corn
- Eggplant
- Grapefruit
- Kiwi
- Mangoes
- Mushrooms
- Onions
- Pineapples
- Sweet Peas
- Sweet Potatoes
- Watermelon





www.choosemyplate.gov

www.hulu.com/watch/63283/super-size-me Written and directed by Morgan Spurlock

www.mayoclinic.com/health/mediterranean-diet/CL00011

Myfitnesspal – app to record intake and exercise

Dash Diet

www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf

The Mediterranean Diet by Marissa Cloutier and Eve Adamson. HarperCollins.



www.ewg.org/goodfood/

www.usp.org US Pharmacopeia for independent
eval of supplements

www.drweil.com Anti-inflammatory diet info

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www.stfranciscare.org/integrative Center for
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