

# **Nutritional Supplements: Whole Body Wellness**

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# Outline

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- Nutrition and its Importance.
- The Linkage between Nutrition and Health.
- Supplements and their Benefits.
- Conclusion

# Importance of Nutrition

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- What is nutrition?
  - The study of the food and liquid requirements for normal physiologic function, including energy, growth, activity, reproduction, and health.
  - Foods contain Macronutrients (Carbohydrates, Fats, and Proteins), Micronutrients (Vitamins and Minerals), and Water.

# Importance of Nutrition

- Why is it so important?
  - We need to make healthy choices to get vitamins, minerals, fiber, water, and other food components in order to stay healthy, increase energy, and prevent diseases, disorders, and/or cancers.

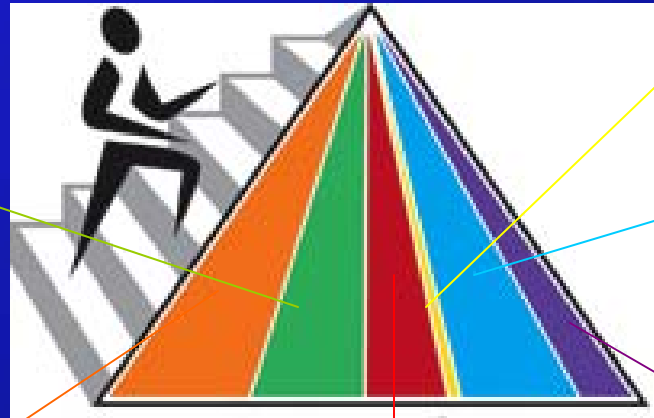
# Importance of Nutrition

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- No single food contains all the essential nutrients the body needs to be healthy and function efficiently.
- Nutritional diet depends on the overall mixture or balance of foods.
- The goal is to achieve an adequate intake of all nutrients in **food pyramid**.

# Importance of Nutrition

## Food Pyramid



Dark Greens: Kale, Broccoli, Cabbage, Dry Beans, Peas

Oils: Fish, Nuts, and Vegetable Oils

Milk: Calcium-rich foods (Yogurt, Cheese). Go low-fat or fat-free (skim)

Grains: Brown rice, buckwheat, oats. 3oz whole grains/day.

Fruits: Berries, Fresh, frozen or canned fruit, 100% juice

Meats & Beans: Low-fat or lean, bake it or broil it. Fish, beans, peas, nuts, legumes, and seeds.

# Linkage between Nutrition and Health

- In 2000, poor diet (and inactivity) was the 2<sup>nd</sup> leading cause of death accounting for 400,000 deaths (16.6%).
- Poor diet may soon overtake tobacco as the leading cause of death.

**Table 2. Actual Causes of Death in the United States in 1990 and 2000**

Actual Cause	No. (%) in 1990*	No. (%) in 2000
Tobacco	400 000 (18)	435 000 (18.1)
Poor diet and physical inactivity	300 000 (14)	400 000 (16.6)
Alcohol consumption	100 000 (5)	85 000 (3.5)
Microbial agents	90 000 (4)	75 000 (3.1)
Toxic agents	60 000 (3)	55 000 (2.3)
Motor vehicle	25 000 (1)	43 000 (1.8)
Firearms	35 000 (2)	29 000 (1.2)
Sexual behavior	30 000 (1)	20 000 (0.8)
Illicit drug use	20 000 (<1)	17 000 (0.7)
<b>Total</b>	<b>1 060 000 (50)</b>	<b>1 159 000 (48.2)</b>

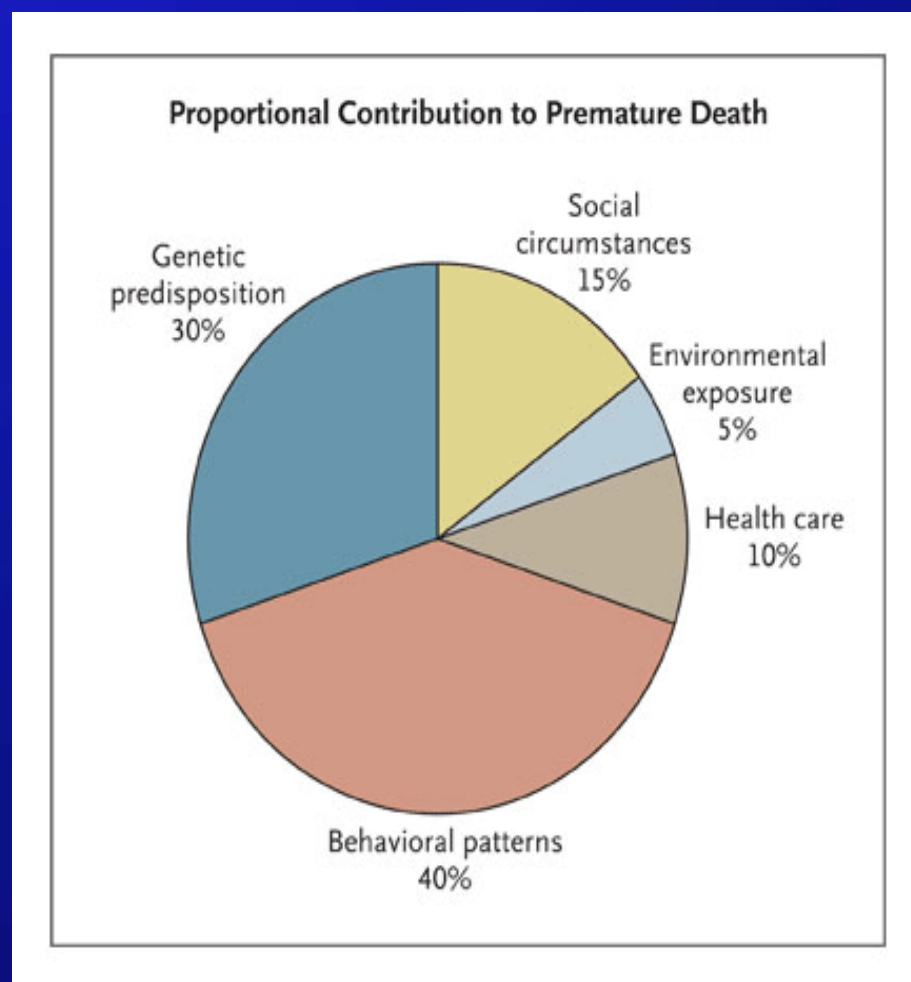
\*Data are from McGinnis and Foege.<sup>1</sup> The percentages are for all deaths.

## Actual Causes of Death in the United States, 2000

Ali H. Mokdad; James S. Marks; Donna F. Stroup;  
Julie L. Gerberding. JAMA. 2004;291:1238-1245.

# Linkage between Nutrition and Health

- Modifiable behavioral risk factors are leading causes of mortality in the United States.
- The single greatest opportunity to improve health and reduce premature deaths lies in personal behavior.
- **Nutritional Supplements can aid in improving nutritional health and assist in preventing diseases; provide chemoprevention measure.**



Schroeder 357 (12): 1221, Figure 1. September 20, 2007

# Chemoprevention

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## Definition:

The administration of agents (drugs, biologics and nutrients) to

- prevent induction of cancers,
- inhibit progression of cancers, *or*
- delay progression of cancers

# Supplements

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- Vitamins and minerals are substances your body needs in small but steady amounts for normal growth, function, and health.
- Our bodies cannot make most micronutrients, therefore, we must get them from the foods we eat or, in some cases, from dietary supplements.
- They are a preparation intended to supply nutrients, vitamins, minerals, fatty acids, or amino acids.
- Intended for ingestion in pill, capsule, tablet, powder, or liquid form.

# The Benefits of Supplements

- Can complement your regular diet if you have trouble getting enough nutrients (balance your diet).
- Can ↑ energy.
- Contain antioxidants, which prevent or slow the oxidative damage to our body (oxidative damage contributes to the onset of heart disease, macular degeneration, diabetes, & cancer).
- Antioxidants may also enhance the immune system, and therefore lower the risk of cancer and infection.

# Agents with Potential Prevention Activity for Carcinoma and Overall Health: 5 Key Ingredients

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Vitamin D

Vitamin C

Omega 3 fatty acids/Fish Oil

Alpha Lipoic Acids

Zyflamend Formula

# Vitamin D

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- Has two main forms: Vitamin D<sub>2</sub> and Vitamin D<sub>3</sub> (active form). Vitamin D<sub>3</sub> could be >3x as effective as vitamin D<sub>2</sub> in raising serum 25(OH)D concentrations and maintaining those levels for a longer time.
- More than 90% of the vitamin D requirement comes from casual exposure to sunlight.
- The use of sunscreen with a SPF of 8 inhibits more than 95% of vitamin D production in the skin.

# Vitamin D

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- 1 MED (minimum erythema dose - the minimum amount of UVB that produces redness 24h after exposure) of UVB radiation in a tanning bed exhibits increases in blood concentrations of Vitamin D that are equivalent to 10,000 – 20,000 IU of Vitamin D.
- 1-MED is equivalent to ~10-50x the recommended adequate intake.
- 20% of the body's surface to tanning bed radiation was effective in ↑ blood concentrations of Vitamin D<sub>3</sub> among both young adults and older adults.
- Tanners in Boston had higher 25(OH)D concentrations of 25(OH)D. ~100 nmol/L in tanners vs. ~40 nmol/L in non-tanners at the end of winter (150% higher).

# Vitamin D

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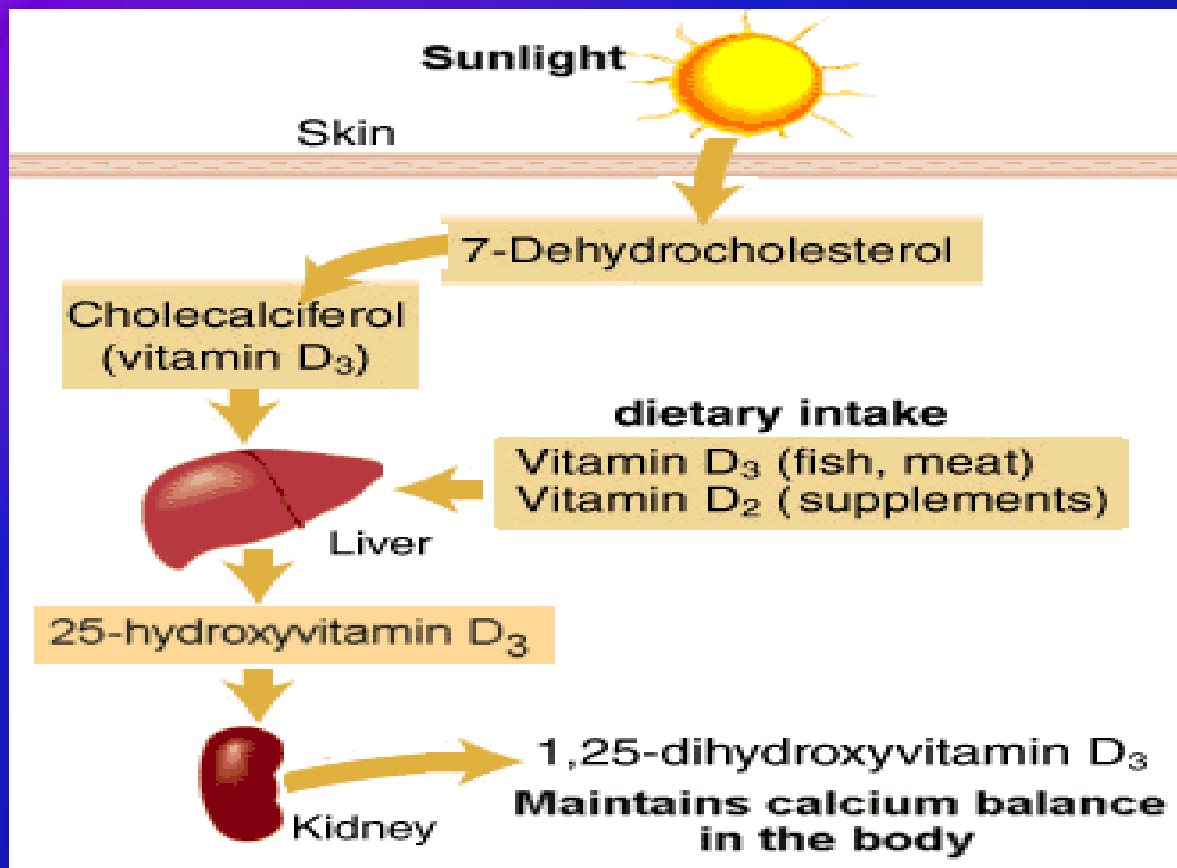
- Melanoma is the most serious form of skin cancer.
- It should be recognized that most melanomas occur on non-sun exposed areas.
- Factors that ↑ the risk of this deadly disease:
  - more sunburn experiences
  - having more moles
  - having red hair

# Vitamin D

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- It is important to have safe sun exposure between 10am and 3pm in the spring, summer, & autumn = only time when enough UVB photons reach the earth's surface to produce Vitamin D<sub>3</sub> in the skin.
- Vitamin D deficiency in children has demonstrated rickets (growth retardation, skeletal deformities, bowed legs, knocked knees).
- Vitamin D deficiency causes osteomalacia in adults and may contribute to osteoporosis.

# Vitamin D Metabolism



- The sun's energy turns a chemical in your skin into vitamin D<sub>3</sub>, is metabolized by the liver to 25(OH)D, then converted by the kidneys to 1,25(OH)<sub>2</sub>D, which is the most metabolically active form.

Vitamin D also increases the intestinal absorption of calcium. Without enough vitamin D, the body can only absorb 10% to 15% of dietary calcium.

# Vitamin D

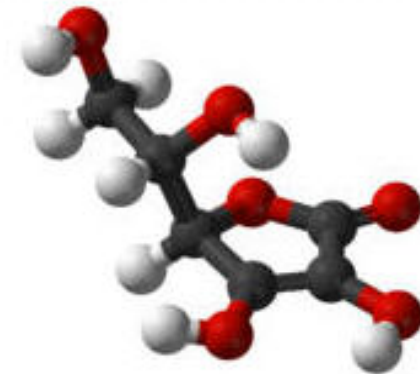
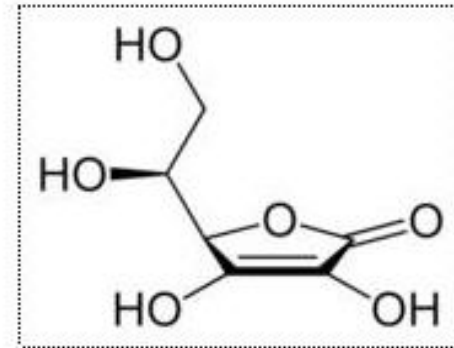
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- Vitamin D deficiency and ↓ exposure to solar UVB radiation have been demonstrated to increase the risks of:
  - common cancers, type 1 diabetes, rheumatoid arthritis, multiple sclerosis, and there are indications deficiency may be associated with type 2 diabetes and schizophrenia.
- Sources of Vitamin D: Oily fish such as salmon, mackerel, sardines, and tuna; mushrooms, Cod liver oil, fortified foods such as milk, orange juice, and some breads and cereals.
- The recommended adequate intake of Vitamin D is 200 IU for children and adults <50y, 400 IU for persons 51-70y, and 600 IU for those ≥ 71y.

# Vitamin C

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- An antioxidant and key immune system nutrient that fights off foreign invaders and tumor cells.
- Contributes to the maintenance of healthy bones, skin, and prevents periodontal disease and the healing of wounds.



Vitamin C

# Vitamin C

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- We cannot produce our own Vitamin C.
- Can be found in citrus fruits like oranges grapefruits, lemons and limes, green and red peppers, broccoli, green leafy vegetables, strawberries, cantaloupe, and tomatoes.



# Omega 3 Fatty Acids

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- May reduce coronary heart disease, blood pressure, and varicose veins by stimulating circulation.
- Strong evidence shows that they can significantly reduce blood triglycerides and raise HDL levels.
- Particularly important for brain memory and performance, and behavioral function.

# Omega 3 Fatty Acids

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- Several studies report possible anti-cancer effects (particularly breast, colon, and prostate cancer). They reduce prostate tumor growth, slow histopathological progression, and increase survival.
- Symptoms of omega-3 fatty acid deficiency include extreme tiredness, poor memory, dry skin, heart problems, mood swings or depression, and poor circulation.
- Cannot be manufactured in the body.

# Foods rich in Omega 3 Fatty Acids

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- Fatty fish such as mackerel, sardines, salmon, tuna, herring, and halibut.
- Oils: Canola, Flaxseed, Soybean, Walnut Oils.
- Walnuts, Pine nuts, Flaxseeds, Pumpkin Seeds.
- Some eggs, such as omega-3 enhanced eggs.



# Alpha Lipoic Acid

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- Water and fat-soluble fatty acid found naturally in every cell in the body.
- Needed to produce energy for our body's normal functions; converts glucose into energy.
- An antioxidant that prevents Vitamin C from becoming a pro-oxidant.

# Alpha Lipoic Acid

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- Has been shown to be beneficial in a number of oxidative stress models such as ischemia, diabetes, cataract formation, HIV activation, degeneration, and radiation injury.
- Found in small amounts spinach, broccoli, peas, Brewer's yeast, brussel sprouts, rice bran, and organ meats.
- 600 mg daily has been shown as the best beneficial, tolerated dosage.

# Zyflamend Formula

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- A unique and anti-inflammatory & anti-cancer herbal preparation.
- Comprised of 10 standardized herbal extracts (rosemary, turmeric, ginger, holy basil, green tea, hi zhang, Chinese goldthread, barberry, oregano, and *Scutellaria baicalensis*).
- Can buy from Whole Foods, GNC, The Vitamin Shoppe, or Online.
- Research shows that it induces apoptosis (cell death) blocks cell proliferation, and suppresses tumor growth in Prostate Cancer Cells.
- Inhibits the COX-1 and COX-2 enzymes, which cause inflammation and pain.

Bemis et al, *Nutrition and Cancer*, 52(2), 202-212, 2005.

# Red Wine Benefits

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- Reduces Low Density Lipoprotein (LDL) cholesterol and raises High Density Lipoprotein (HDL) cholesterol.
- Aids in prevention of blood clots.
- Contains the antioxidant Resveratrol, which suppresses growth of cancerous cells.
- Also contains Quercetin, which is an antioxidant that acts as an antihistamine and helps reduce inflammation associated with various forms of arthritis, and heart disease.



# Resveratrol & Quercetin: Other Sources

## RESVERATROL

- Grape and Cranberry juices
- Raspberries, blueberries, and bilberries.
- Non alcoholic wines
- Red & White grapes



## QUERCETIN

- Apples
- Red Onions
- Grapes
- Dark cherries
- Dark berries, such as blueberries, blackberries, and bilberries

# Red Wine: How Much Should be Consumed?

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- 4 oz. glass is one serving of wine.
- Men should have one to two glasses of wine per day.
- Women should only have one glass of wine per day.
- “Researchers found that the risk of prostate cancer decreased 6% for every glass of red wine consumed.”

## **Other Supplements with Potential Carcinoma Reduction Activity**

- Green lean cruciferous vegetables (kale, broccoli, cauliflower, cabbage, collard greens) that are lightly steamed.
- Whole-grains (Brown rice, buckwheat).
- All kinds of berries (1-2 cups/day).

# Conclusion

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- Nutritional factors can positively affect health.
- Supplements are not intended to diagnose, cure, or treat disease.
- Complement regular diet; are not meant to be food substitutes.
- Chemopreventive measures start early in life, not just in adulthood.
- You are as healthy as the food you eat.
- Know your numbers: actively participate in your personal health.