

Nutrition & Cancer Prevention



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Objectives

- Understand the American Institute of Cancer Research Guidelines
- Promote awareness of the link between nutrition, physical activity and cancer prevention



History of Nutrition and Cancer

- Yong-He-Yan (Song Dynasty: 960-1279 A.D.)
 - Poor nutrition led to cancer
- Dr. Richard Wiseman (1676)
 - Cancer due to 'an error in diet'
- Animal studies (1930's)
- Population studies (1970's)






Source: Kiple KF, Ornelas KC. The Cambridge World History of Food, 2000.

History of Physical Activity and Cancer

'Eating alone will not keep a man well; he must also take exercise, for food and exercise, while possessing opposite qualities, yet work together to produce health...'

Hippocrates (460-377 B.C.)

Source: Dishman RK, Washburn RA, Heath GW. Physical Activity Epidemiology, 2004.


AICR Publications




www.AICR.org

What is Cancer?

- Cancer cells develop because of
 - Damage to the DNA
 - Epigenetics: identifying other pathways outside DNA
- DNA - cancer starts when a **single** cell divides in an abnormal way
 - Cells **multiply**, affecting the tissue or organ on which they are growing
 - **Spread** of these cells to other body parts occur
- Epigenetics
 - Lack of control to keep cells together



Source: American Cancer Society @ www.cancer.org

Controllable Causes of Cancer

Lifestyle Choices



Dietary Intake
Physical Activity
Weight



Avoid Alcohol Use
Avoid Tobacco Use
Stop Spread of HPV Virus

Source: American Institute for Cancer Research @ 2005-2008

POWER of PREVENTION

1. Eat a variety of healthful foods, with a focus on plant foods
2. Maintain a healthy weight throughout life
3. Adopt a physically active lifestyle
4. Limit **Avoid** consumption of alcoholic beverages and tobacco use and exposure
5. Become involved in your community

Source: CA Cancer J Clin 2006;56:254-281

Nutrition and Physical Activity Guidelines



I. Eat foods mostly of plant origin

Nutrition Guidelines

- Eat five or more servings of vegetables and fruits each day
 - Include vegetables and fruits at meals and snacks
 - Eat a variety of vegetables and fruits
 - Limit fried vegetable products
 - Choose 100% juice for fruit or vegetable juices



Vitamins and Minerals

- Not important
- Do not protect against cancer
- Newer technology – phytochemicals
 - Beta carotene
 - Lycopene
 - Flavones – resveratrol

Phytochemicals

Food	Phytochemical	Function
Vegetables, Fruits		
Berries, deep red, orange, blue color	Anthocyanidin	Anticarcinogen, anti-inflammatory, antioxidant, may prevent diabetes + obesity
Carrots, Squash, Apricots, Peaches	Beta-Carotene	Protects the immune system
Garlic, Onions	Allylic sulfide (allicin)	Intercepts and detoxifies
Red Grapes	Resveratrol	Antioxidant and anticholesteremic
Tomatoes	Lycopene	Anti-cancer, antibacterial, antifungal
Grains + Beans		
Oatmeal	Soluble fiber	Reduces blood cholesterol
Soy, chickpeas	Genistein	Antioxidant, anticholesterol, anticancer, reduce hot flushes
Nuts		
Walnuts	(pre Omega-3)	Anti-inflammatory

Did You Know?

- Eating cruciferous vegetables has been linked to a reduced risk of certain types of cancer

Source: J Nutr Biochem. 16:65-73:2005



- Eating allium foods may also provide cancer protection

Sources: J Nutr 136:864S-869S:2006, Asian Pacific J Cancer Prev 5:237-245



Did You Know?

- Citrus fruits are packed with cancer fighting substances known as antioxidants

Sources: J Nutr 134:3175S-3176S:2004, J Nutr 134:3196S-3198S:2004



- Herbs and spices may be powerful tumor suppressors

Source: J Nutr 131:3034S-3036S:2001



Choose Whole Grains

- Choose whole grains
 - Include whole grain rice, bread, pasta, and cereals
 - Limit pastries, sweetened cereals, and other foods and beverages high in sugar



Choose Plant and Dairy Protein Foods

- Choose plant foods high in protein
 - Choose soy, quinoa, beans, nuts, and seeds
- Choose dairy foods
 - Eggs, milk, milk substitutes



Source: CA Cancer J Clin 2006;56:254-281

Limit Consumption of M/F/P

- Limit or avoid red meat
 - Red meat includes beef, pork, lamb, veal, goat, bison
- Avoid processed, prepared and smoked meats.
- Avoid grilling that results in burned or charred products. Avoid smoked foods
- If eat flesh food, choose fish or poultry

Source: CA Cancer J Clin 2006;56:254-281

Did You Know?

- Grilling and other high heat cooking methods can result in the formation of cancer causing substances
- For safer grilling:
 - Protect all food from smoke rising from heat source
 - Use foil
 - Marinate and/or pre-cook meats before grilling
 - Use lean meats
 - Remove charred / burned meat portions
 - Grill vegetables and fruits



Sources: Nutr Reviews 63:158-165, www.aicr.org

Did You Know?

- Foods high in Vitamin D and Calcium are joining the list of foods to eat for tumor prevention.



Nutrition and Physical Activity Guidelines



2. Adopt a physically active lifestyle

Source: CA Cancer J Clin 2006;56:254-281

Physical Activity Guidelines

- **Adults:**
 - Engage in at least moderate activity for 30 minutes or more on 5 or more days of the week
- **Children and Adolescents:**
 - Engage in at least 60 minutes per day of moderate to vigorous physical activity for at least 5 days per week



Source: CA Cancer J Clin 2006;56:254-281

Nutrition and Physical Activity Guidelines



3. Maintain a healthful weight throughout life

Source: CA Cancer J Clin 2006;56:254-281

Healthful Weight

- Calories do count
 - Keep calories within range for your height and weight
- Being overweight or obese is associated with an increased cancer risk
- Balance caloric intake with physical activity
- Lose weight if currently overweight or obese



Source: CA Cancer J Clin 2006;56:254-281

Recommendation for Community Action



4. Plan Community Action

Recommendation for Community Action

- Work to create environments that support healthful nutrition and physical activity behaviors
 - Increase access to healthful foods
 - Provide access for physical activity, transportation and recreation



Source: CA Cancer J Clin 2006;56:254-281

Vitamin D and Cancer

- Skin cancer and melanoma
 - Blamed on sun
 - Melanoma may not related to sun
- Cancer prevention and vitamin D
 - Blood level correlated with diseases, including cancer
 - DINOMIT model by Garland et al
 - Epidemiological projections of blood level

Garland,

Summary: Approach to Cancer Prevention

- Start with the early stages of life
- Limit exposure to toxins
- Provide healthful foods
- Promote a healthy weight
- Encourage physical activity
- Plan for prevention



Source: J Nutr 135:2934S-2945S

Thanks

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- You can use these links to skip to individual recommendation pages, or you can start with the first and follow links from page to page through the entire list.
- [Be as lean as possible without becoming underweight.](#)
- [Be physically active for at least 30 minutes every day.](#)
- [Avoid sugary drinks. Limit consumption of energy-dense foods.](#)
- [Eat more of a variety of vegetables, fruits, whole grains and legumes such as beans.](#)
- [Limit consumption of red meats \(such as beef, pork and lamb\) and avoid processed meats.](#)
- [If consumed at all, limit alcoholic drinks to 2 for men and 1 for women a day.](#)
- [Limit consumption of salty foods and foods processed with salt \(sodium\).](#)
- [Don't use supplements to protect against cancer.](#)
- [#] [It is best for mothers to breastfeed exclusively for up to 6 months and then add other liquids and foods.](#)
- [#] [After treatment, cancer survivors should follow the recommendations for cancer prevention.](#)
- [#] [Special Population Recommendations](#)
- And always remember do not smoke or chew tobacco.