

# DIET AND CANCER

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## Cancer Overview



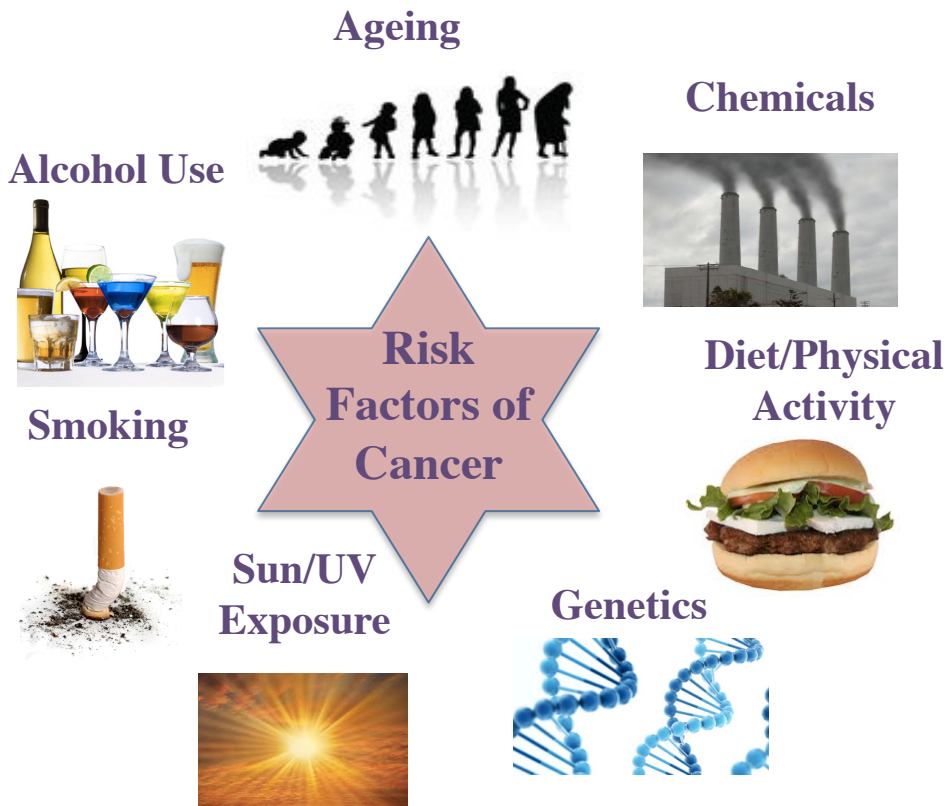
- **What is cancer?**

- A generic name for a group of more than 100 diseases.
- Abnormal cells grow out of control. Instead of dying, cancer cells continue to form new and grow abnormal cells.
- Cells become cancer cells because DNA is damaged. In cancer cells, damaged DNA is not repaired.

- **Why should we be concerned?**

- In the US, Cancer remains the second most common cause of death in the US, accounting for nearly 1 of every 4 deaths.

**More than 60% of cancers in the United States occur in people aged 65 and older.**



# *Diet and Cancer*

- **Why is diet important?**
  - Diet is under YOUR control!
  - Making lifestyle changes such as diet and physical activity can help prevent nearly HALF of all cancer deaths.
- **Food is important *before, during, and after* cancer treatment.**
  - Following a healthy diet during your lifetime can decrease your risk of developing cancer.
  - During treatment there are many nutritional complications that affect what we eat such as:
    - Anorexia, Cachexia, Altered Taste Changes, Weakness, Fatigue, Nausea, Vomiting
    - ... that can be positively influenced and supported through nutrition during cancer treatment.
  - After treatment, following a healthy diet will help with recover and reduce your risk of relapse.



**One-third of all cancer deaths in the US are related to diet and physical activity.**

# *The American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention*

- **Achieve and maintain a healthy weight throughout life.**



- Be as lean as possible throughout life without being underweight.
- Avoid excess weight gain at all ages. For those who are overweight or obese, losing even a small amount of weight has health benefits and is a good place to start.
- Regular physical activity and limit intake of high-calorie foods and drinks as keys to help maintain a healthy weight.

- **Be physically active.**

- Adults: engage in at least 150 minutes of moderate intensity or 75 minutes of vigorous intensity activity each week (or a combination of these), preferably spread throughout the week.
- Limit sedentary behavior such as sitting, lying down, watching TV, and other forms of screen-based entertainment.
- Doing some physical activity above usual activities, no matter what one's level of activity, can have many health benefits.
- Always check with your doctor before starting an exercise program.

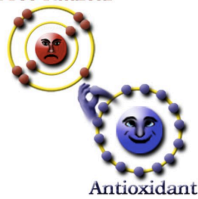
- **Eat a healthy diet, with an emphasis on plant foods.**

- Choose foods and drinks in amounts that help you get to maintain a healthy weight.
- Limit consumption of processed meat and red meat you eat.
- Eat at least 2 ½ cups of vegetables and fruits each day.
- Choose whole grains instead of refined grain products.

- **If you drink alcohol, limit consumption.**

- Drink no more than 1 drink per day for women or 2 per day for men.
- One drink is defined as:
  - Beer: 12 oz
  - Wine: 5 oz
  - Malt Liquor: 8 oz
  - Hard Liquor: 1.5 oz





Antioxidant

# Antioxidants and Cancer

**Antioxidants may prevent the development of cancer through scavenging free radicals in the body, decreasing cellular damage.**

- **Possible concern:**
  - New research shows possible interference of an abundance of antioxidants with cancer cell-killing treatment.
  - Supplementation of Beta-Carotene has been shown to increase risk of lung cancer.
- **Bottom line:**
  - Taking antioxidants in their supplement form may be harmful to the body due to extreme doses.
  - The best way to take in antioxidants is through their natural form in fruits and vegetables.
- **Vitamin A (Beta Carotene):** *Dark orange, red, yellow, and green veggies*
  - Broccoli                      ■ Kale
  - Spinach                      ■ Oranges
- **Vitamin C:** *Citrus Fruits*
  - Berries                      ■ Sweet Potatoes
  - Cantaloupe                      ■ Red and Yellow Peppers
  - Mango
- **Vitamin E:** *Vegetable Oils and Grains*
  - Oatmeal                      ■ Olive, Soybean & Corn Oi
  - Nuts and nut butters                      ■ Sweet Potatoes
  - Whole Grains                      ■ Dark, leafy greens
- **Selenium and Zinc:** *Protein and Seafood Sources*
  - Beans
  - Eggs
  - Fish
  - Nuts



Eating a well balanced diet rich in fruits and vegetables (5 servings/day) will provide you with the optimal mix antioxidants giving you the best overall health benefit.



# *Vegetables and Cancer*

**Cruciferous vegetables may provide preventative effects in the development of cancer.**

- **What are CRUCIFEROUS vegetables?**
  - The Brassicaceae vegetable family
  - Arugula
  - Kale
  - Bok Choy
  - Cauliflower
  - Broccoli
  - Turnips
  - Watercress
  - Collard Greens
  - Radishes
- **The sulfur-containing compounds found in these vegetables can potentially prevent cancer in many ways:**
  - Protection of DNA damage.
  - Inactivation of carcinogens (a substance that is directly involved in causing cancer).
  - Anti-Inflammatory effects.
  - Induction of cell death (apoptosis).

*It is recommended to consume 2 ½ servings of vegetables per day. 1 serving = 1 cup raw vegetable, 2 cups of leafy greens, or ½ cup cooked vegetables.*



**Cruciferous vegetables are also a good source of carotenoids (Vitamin A), Vitamins C, E, and K, Folate, and Fiber!**

# *Soy Foods and Cancer*



- **What are soy foods?**
  - Soy foods are made of soybeans and apart of the legume family.
  - Soybeans are recognized as a high-quality protein.
  - Examples:
    - Tofu, soy milk, soy nuts, soy powder, veggie burgers and edamame
- **Nutritional benefits of soy:**
  - Good source of dietary protein and fiber:
    - $\frac{1}{4}$  cup of soybeans provides 11 g of protein and 3 g of fiber.
  - Studies report that dietary soy protein is associated with decreased total cholesterol and the LDL cholesterol (the “bad” cholesterol ).
- **Soy foods and cancer:**
  - The relationship between soybean products and cancer risk has been controversial, complex and evolving.
- **Bottom line from ASC:**
  - Although animal studies showed mixed effects from soybean products on breast cancer, human studies showed no harm from consuming dietary soy.
  - Moderate soy products appear to be safe for both general population and breast cancer survivors. Soy supplementation should be avoided until more research.
  - Soy products are healthy and delicious! But always check with your doctor regarding the consumption of soy if you have cancer.





# *Sugar and Cancer*



- **Sugars: simple carbohydrates**
  - Provide approximately 4 kcals/g
  - Examples: glucose, fructose, galactose, maltose, sucrose, lactose.
- **Does sugar feed the cancer cells?**
  - Glucose is needed to feed every cell in the body, so eventually your body will produce sugar from protein and fat sources if glucose is unavailable.
  - High intake of simple sugars increases the production of insulin and other growth hormones that may stimulate the cells on the tumor.
  - Excessive sugar intake also contributes to overweight and obesity, increasing the risk of cancer but sugar itself does not cause cancer.
- **Bottom line:**
  - Choose quality carbohydrate sources such as fruits and complex carbs (whole grains).
  - Avoid high fructose corn syrup and products high in added sugar.
- **Do non-nutritive sweeteners and sugar substitutes relate to increased risk for cancer?**
  - Examples of non-nutritive sweeteners:
    - Aspartame, Saccharin
    - Brands: Splenda, Sweet N Low, Equal
  - There is no evidence to support that non-nutritive sweeteners and sugar substitutes cause cancer.



# Alcohol and Cancer



- **Alcoholic drink:** Any beverage that contains ethanol (ETOH)

- **Calories in alcohol:** 7 kcal/g

- **Beer (Ale):**



- Barley or other cereal grains with a 3-7% alcohol content.
- Contains bioavailable compounds such as phenol and polyphenols.
- A source of magnesium, potassium, riboflavin, folate, and B-vitamins.

- **Wine:**



- Usually produced from grapes with a 9-15% alcohol content.
- The color and strength of the wine depends on the type of grapes, growing environment, and length of fermentation.
- High levels of phenolic and polyphenols compounds (high antioxidant capacities).
- Also contains sugars, acetic acid, calcium, copper, iron, magnesium, potassium, B1, B2, B6, and C.

- **Spirits/liquors (Brandy, Whisky, and Gin):**

- Produced from cereal grains.
- Distilled to give a higher concentration of alcohol: 35-50% or more.

- **Alcohol and cancer:**



- Related to an increased risk of cancer (mouth, pharynx, larynx, and liver).
- Alcohol acts as a solvent for other carcinogens, increases penetration into cells.
- Chronic alcohol consumption is related to about 4% of cancers globally.

**ACS guidelines: 2 drinks/day for men, 1 drink/day for women**

# *Dietary Supplements and Cancer*

*“Dietary supplements are any product taken by mouth that contains a “dietary ingredient” intended to supplement the diet” - from the Dietary Supplement Health and Education Act (1994)*

- Vitamins
- Minerals
- Herbs
- Amino Acids
- Enzymes



- **Are they safe?**

- Supplements are regulated by the FDA, however, manufacturers are NOT required to get FDA approval before selling their product.
- Sellers are NOT required to have clinical research studies to prove safety.
- Patients on radiation and/or chemotherapy are at higher risk for drug/nutrient interactions.

- **Bottom line:**

- Although it is often recommended to avoid supplements during treatment, if you decide to do so...
- Be sure to discuss all supplements you are considering taking and/or currently taking with your physician to reduce your risk of drug/nutrient interactions.
- Read the labels!!
- Avoid taking multiple supplements at once, start with one at a time.

**“Supplements can be useful in reducing the risk of some diseases, however, the intention of dietary supplements is NOT to treat, diagnose, cure or relieve the effects of diseases.”- ACS**

# Mediterranean Diet and Cancer

- **A Mediterranean Diet:**

- Emphasizes *whole grains, fruits, and vegetables* at EVERY meal.
- *Olive oil*, a healthy monounsaturated fat, is the primary source of fat in this diet.
- *Beans, legumes, and nuts* are used as a source of lean protein, limiting red meat intake.
- While poultry and eggs are recommended to be consumed in moderation, *fish* is recommended twice a week.
- Low-fat dairy products, such as cheese, milk, and yogurt are to be consumed in moderation on a daily or even weekly basis.
- *Herbs and spices* are emphasized as well, substituting out salt in our diet.
- Consuming at least 6 glasses of *water* each day is recommend to keep us hydrated, and *wine* is also recommended, but in moderation.
- Highlights the importance of regular physical activity.

- **Health Benefits:**

- Reduced risk of heart disease and death from heart disease and cancer.
- Reduced incidence of Parkinson's and Alzheimer's.
- Improved cholesterol levels (LDL).
- Decreased prevalence of high blood pressure

*There is research to support a reduction in cancer incidents and mortality of cancer when following a Mediterranean Diet.*



# Very Berry Smoothie

*Recipe adapted from: The Cancer Fighting Kitchen: Nourishing, Big-Flavor Recipes for Cancer Treatment and Recovery by Rebecca Katz*

- **Ingredients:** (Serves 2)

- ¼ cup Orange Juice
- 1 cup Plain Yogurt
- 1 cup Water
- 1 cup Frozen Strawberries
- 1 ½ cups Frozen Blueberries
- ½ cup Frozen Raspberries
- 1 Tbsp. Honey
- 1 scoop Whey Protein Powder (Optional)

- **Nutrition Information:**

(Per serving)

- Calories 145
- Fat 4.6g
  - Saturated Fat 1.8g
- Carbohydrate 24g
  - Fiber 5g
- Protein 4g
- Sodium 40 mg

- **Preparation:**

1. Blend all ingredients in a blender until smooth.
2. Serve cold and enjoy!

**This smoothie is rich in cancer-fighting antioxidants. Adding in a scoop of whey protein powder will help to increase your protein intake throughout day too!**



# Roasted Mashed Cauliflower

*Recipe developed by: Jamie Houdek and Kelly Tasky, Dietetic Interns, Rush University Medical Center*

- **Ingredients:** (Serves 4)

- 1 head of Cauliflower Florets
- 1 clove of Garlic, chopped
- 1 Shallot, chopped
- 1/8 tsp. Salt
- 1/8 tsp. Pepper
- ½ cup Greek Yogurt
- 1 Tbsp. Parmesan, shredded

- **Nutrition Information:**

(Per serving)

- Calories 68
- Fat 1g
  - Saturated Fat 0g
- Carbohydrate 10g
  - Fiber 3g
- Protein 6g
- Sodium 122mg

- **Preparation:**

1. Preheat oven to 425 °F.
2. Place the cauliflower, garlic and shallots on a sheet of tin foil and season with salt and pepper. Wrap the ingredients in the tin foil to create a tightly sealed pocket.
3. Place pockets on rack in preheated oven for 25-35 minutes or until cauliflower is tender.
4. Place cooked ingredients and Greek yogurt into food processor and blend until desired consistency; be careful not to blend too long.
5. Garnish with shredded Parmesan cheese.

**Cauliflower is apart of the cruciferous family of vegetables making it full of cancer preventative nutrients along with Vitamin C and Folate.**



# *Citrus Kale and Quinoa Salad*

*Recipe developed by: Jamie Houdek and Kelly Tasky, Dietetic Interns, Rush University Medical Center*

- **Ingredients:** (Serves 4)

- 1 ½ cups Quinoa, cooked
- 1 cup Kale, chopped
- 1 Pomegranate, seeded
- ½ cup Walnuts, chopped
- 1 Avocado, peeled and diced
- 1 lb. Chicken, diced & cooked

- **Nutrition Information:**

(Per serving)

- Calories 390
- Fat 18.2g
  - Saturated Fat 2.4g
- Carbohydrate 49g
  - Fiber 4g
- Protein 12g
- Sodium 23 mg

- **Dressing Ingredients:**

- ¼ cup Lime Juice
- 2 Tbsp. Orange Juice
- 1 Tbsp. Honey
- 1/3 cup Cilantro

- **Preparation:**

1. Whisk together dressing ingredients.
2. Combine all salad ingredients together in a bowl.
3. Mix together salad ingredients and dressing and enjoy!

**This salad provides a balance between healthy fats, whole grains, and protein while providing a variety of essential vitamins, minerals and other beneficial cancer-fighting antioxidants and phytochemicals.**



# Butternut Squash, Tomato, and Watercress Soup

*Recipe adapted from: The New American Plate Cookbook by The American Institute of Cancer Research*

- **Ingredients:** (Serves 4)

- 2 Tbsp. Olive Oil
- 2 large Tomatoes, seeded and chopped
- 1 small Onion, chopped
- 1 small Garlic Clove, sliced
- 2 small Carrots, chopped
- 1 cup Butternut Squash, peeled & chopped
- 1 medium Potato, peeled and chopped
- 1 bunch Watercress, including stems
- 2 cups reduced-sodium Vegetable Broth
- 4 cups Water
- Salt and Pepper to taste
- 2/3 cup frozen Corn Kernels, thawed

- **Nutrition Information:**

(Per serving)

- Calories 111
- Fat 5 g
  - Saturated Fat <1 g
- Carbohydrate 16 g
  - Fiber 3 g
- Protein 3 g
- Sodium 167 mg

- **Preparation:**

1. Heat olive oil in a large saucepan.
2. Sauté tomatoes, onion and garlic for 12 minutes, stirring occasionally.
3. Add carrots, squash, potato, watercress, vegetable broth, and water.
4. Bring ingredients to a boil, reduce heat to low, and simmer for 30 minutes uncovered.
5. Remove saucepan from the heat, allow to cool for 15 minutes.
6. In a blender, puree the soup in batches and return to the saucepan.
7. Season to taste with salt and pepper.
8. Reheat soup and serve garnished with corn kernels.

**This soup is full of vegetables offering many cancer fighting nutrients including antioxidants, Vitamins A, C, E, K, Iron, Calcium**

