Lecture 87:

Dietary Changes in Common Cancers

Part 1

Copyright Protection:

Cancer Review.

Three Common Cancers:

- **Breast Cancer.**
- **Colon Cancer.**
- **Prostate Cancer.**

Cancer Review:

Why do you, as a sports nutrition advisor, need to know about cancers?

- **1) Exercise reduces the risk of developing certain cancers.**
- **2) Exercise can affect the survival rate.**
- **3) Dietary changes are important in cancer recovery and prevention.**

Distribution of Cancer:

- **Cancer is a nationwide disease.**
- **The most important risk factor for cancer is age.**
- **About 75% of cancers appear at age over 65.**
- **Overall risk of developing cancer in life time:**
- **Men: 44%**
- **Women: 38%**

Distribution of Cancer Incidence:

Men		Women	
Cancer	Incidence (%)	Cancer	Incidence (%)
Prostate	28	Breast	28
Lung	15	Lung	14
Colorectal	9	Colorectal	10
Bladder	7	Endometrial	6
Melanoma	5	Thyroid	5
Lymphoma	4	Lymphoma	4
Kidney	4	Melanoma	4
Oral cavity	3	Kidney	3
Leukemia	3	Oral cavity	3
Pancreas	3	Pancreas	3
All others	19	All others	20

Cancer Death Rate:

Men		Women	
Cancer	Rate (%)	Cancer	Rate (%)
Lung	29	Lung	26
Prostate	11	Breast	15
Colorectal	9	Colorectal	9
Pancreas	6	Pancreas	7
Liver	4	Ovary	5
Leukemia	4	Lymphoma	4
Esophagus	4	Leukemia	3
Lymphoma	4	Endometrial	3
Bladder	3	Liver	2
Kidney	3	CNS	2
All others	23	All others	24

Patient Management:

When someone is diagnosed with a cancer, the first priority is to determine the extent of disease:

- **1) Staging: it shows tumor burden.**
- **2) Physiologic reserve of the patient: it is an indicator of how well a patient will cope with the physical and emotional stresses imposed by the cancer and its treatment.**

Physiologic reserve of the patient is evaluated by one of the followings:

- **1) Karnofsky Performance Index.**
- **2) The Eastern Cooperative Oncology Group (ECOG) Performance Scale.**

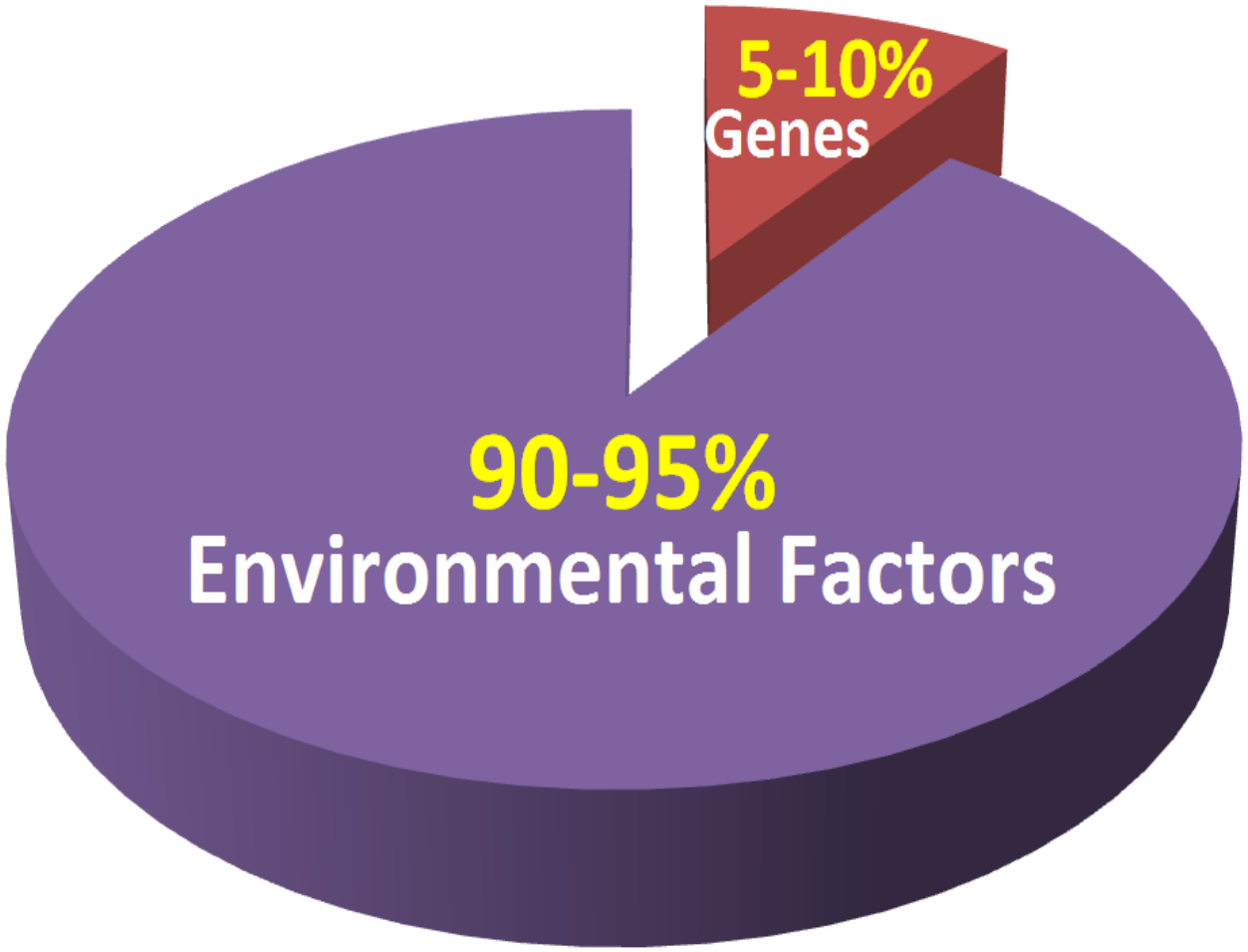
Karnofsky Performance Index

Performance Status	Functional Capability of the Patient
100	Normal; no complaints; no evidence of disease
90	Able to carry on normal activity; minor signs or symptoms of disease
80	Normal activity with effort; some signs or symptoms of disease
70	Cares for self; unable to carry on normal activity or do active work
60	Requires occasional assistance but is able to care for most needs
50	Requires considerable assistance and frequent medical care
40	Disabled; requires special care and assistance
30	Severely disabled; hospitalization is indicated although death is not imminent
20	Very sick; hospitalization necessary; active supportive treatment is necessary
10	Moribund; fatal processes progressing rapidly
0	Dead

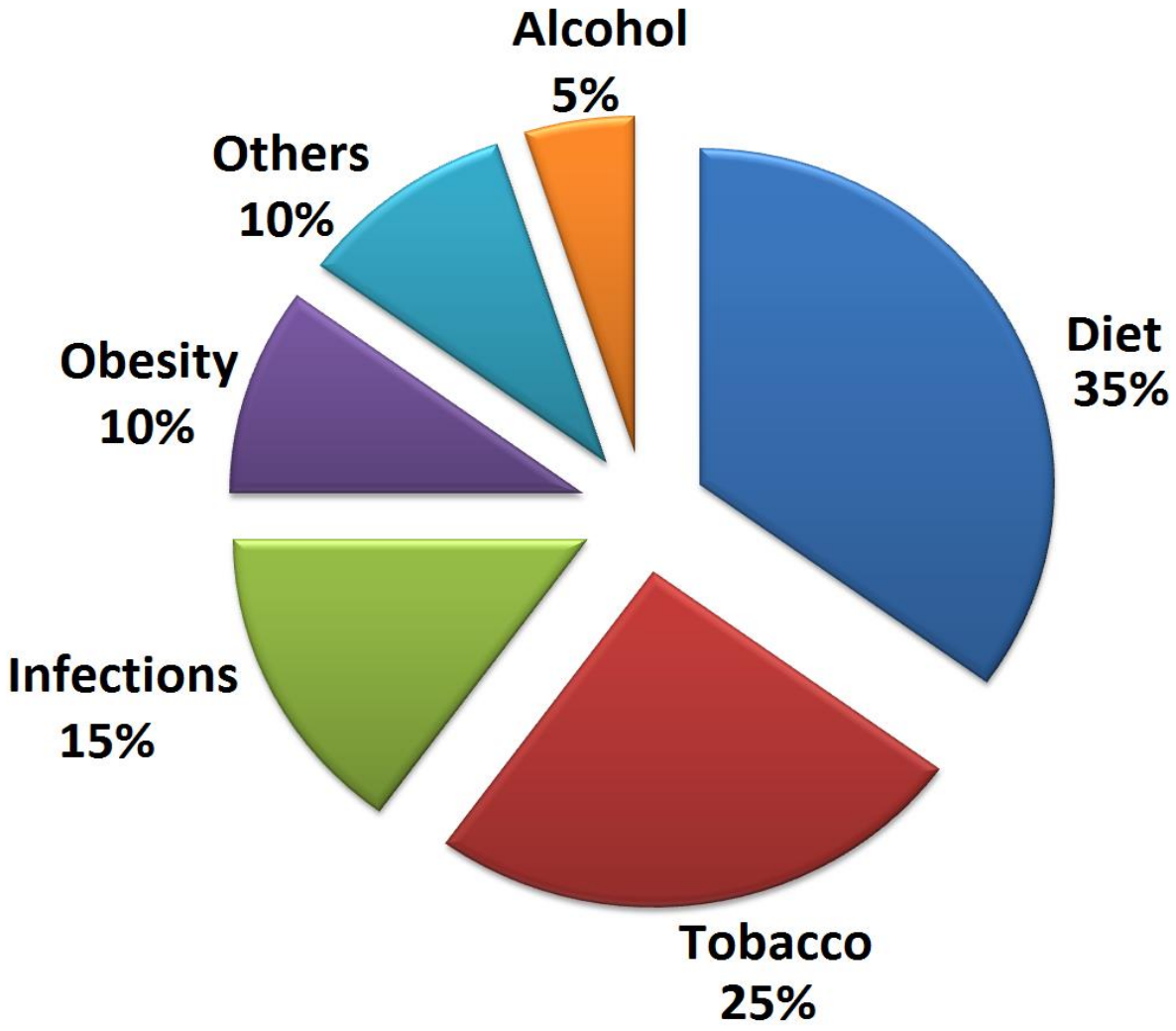
The Eastern Cooperative Oncology Group (ECOG) Performance Scale:

Grade	ECOG Performance Scale
0	Fully active, able to carry on all predisease performance without restriction
1	Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light housework, office work
2	Ambulatory and capable of all self-care but unable to carry out any work activities. Up and about more than 50% of waking hours
3	Capable of only limited self-care, confined to bed or chair more than 50% of waking hours
4	Completely disabled. Cannot carry on any self-care. Totally confined to bed or chair
5	Dead

Causes of Cancers



Environmental Factors:



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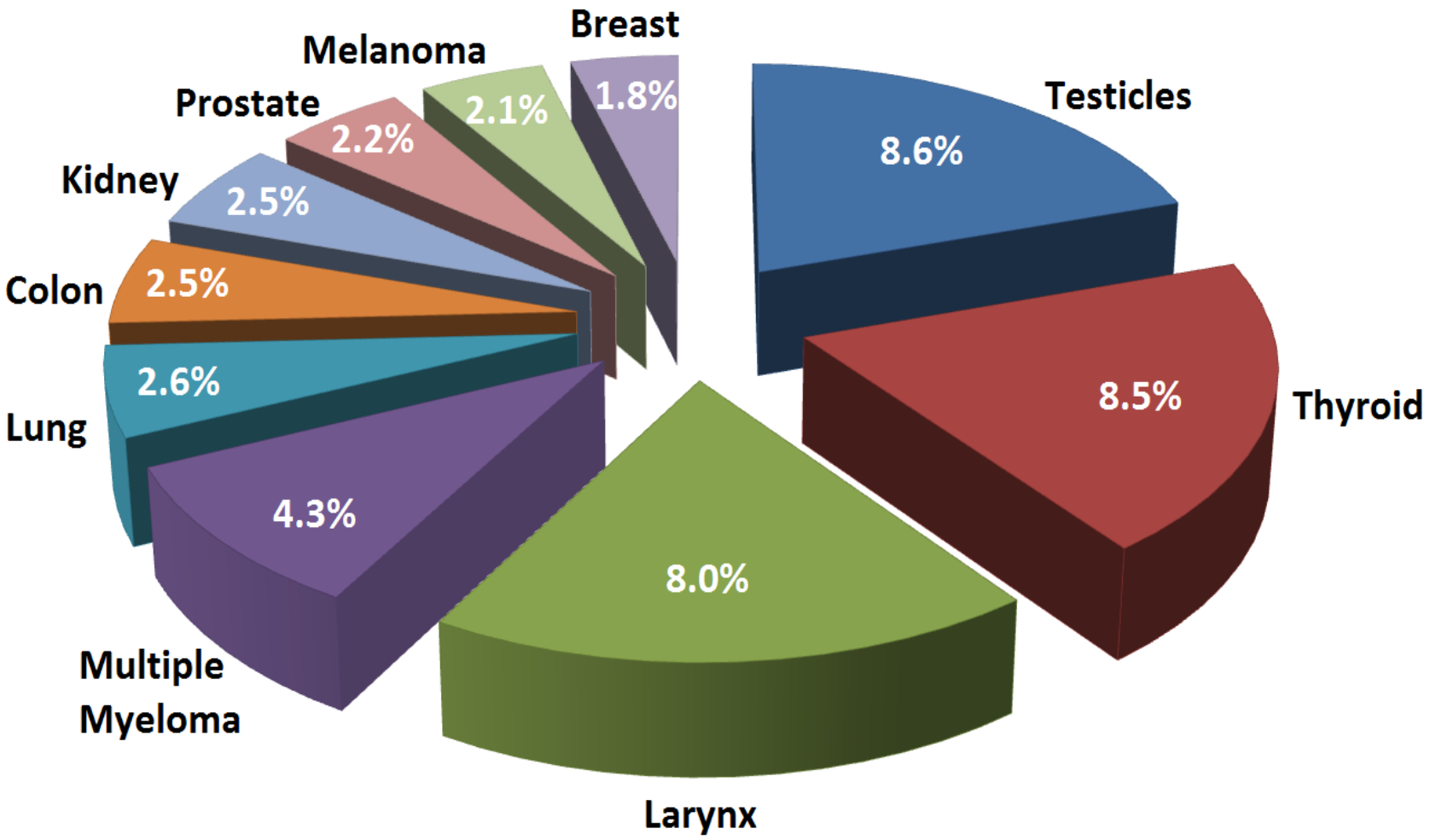
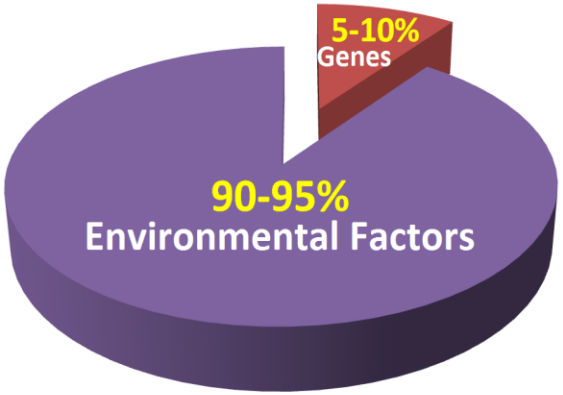
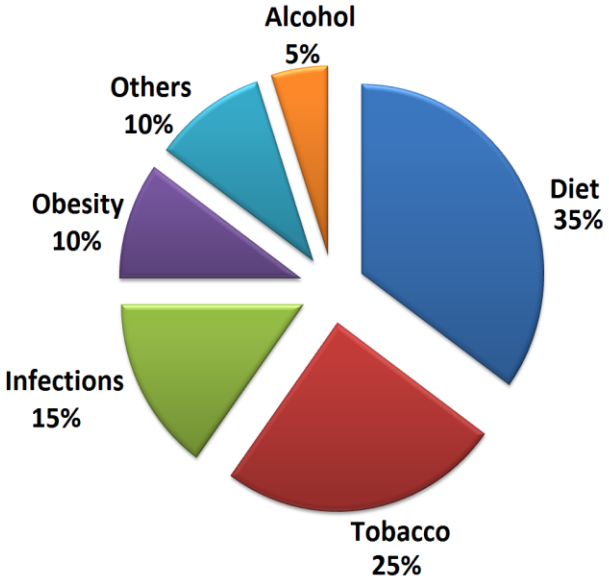

Breast
1.8%
Melanoma
2.1%
Prostate
2.2%
Kidney
2.5%
Colon
2.5%
Lung
2.6%
Multiple Myeloma
4.3%
Larynx
8.0%
Thyroid
8.5%
Testicles
8.6%

Causes of Cancers





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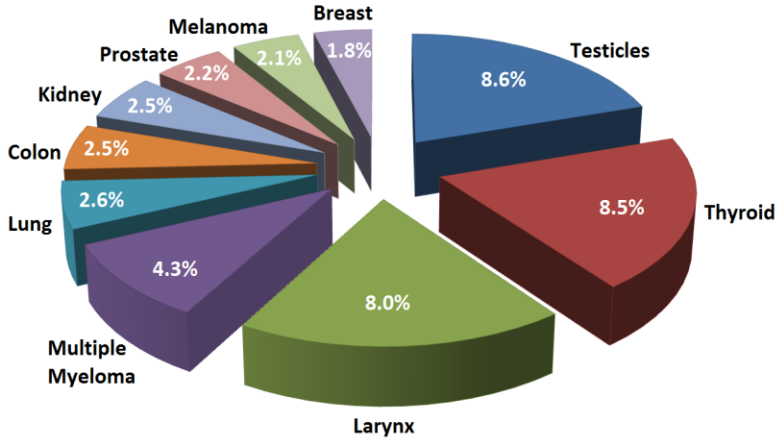


Genes:

Cancer Prevention:

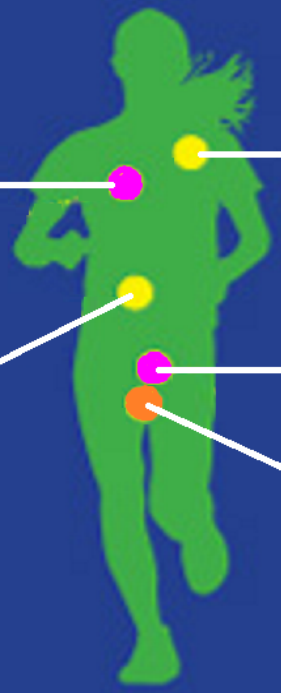
1) Exercise:

- **Exercise is associated with a decreased risk of cancers especially lung, colon, breast, uterus and prostate.**

- **Exercise increases survival rate in patients with cancers especially breast and colon.**

According to National Cancer Institute:

Exercise Decreases Risk of Cancer.



Breast
20-80%

Lung
20%

Colon
30-40%

Uterus
20-40%

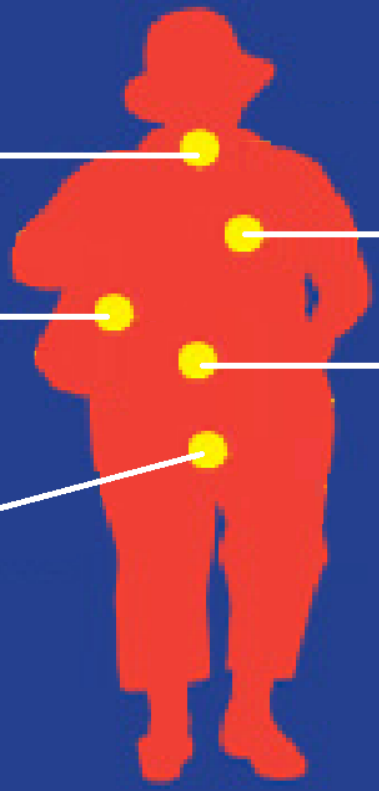
Prostate
30-40%

...So Get up

...& Move!

Canadian Academy of Sports Nutrition

Obesity increases the risk of the following Cancers:



Source:
Harrison`s Principles of Internal Medicine

Canadian Academy of Sports Nutrition

Obesity is associated with higher mortality from the following cancers: (Harrison`s Principles of Internal Medicine)

Men

- Esophagus.
- Colon.
- Rectum.
- Pancreas.
- Liver.
- Prostate.

Women

- Gallbladder.
- Bile ducts.
- Breast.
- Endometrial.
- Cervix.
- Ovaries.

Possible mechanisms:

- **A) in women, increased rate of conversion of androstenedione to estrone in adipose tissue of obese people.**

- **B) imbalance among insulin, leptin, adiponectin and IGF-I**

Protective Effects of Exercise on Cancer:

- **Large scale epidemiologic studies confirm that there is an inverse relation between exercise and overall cancer occurrence.**

- **The risk of cancer is low among those who are physically active either occupationally or leisurely.**

Protective Effects of Exercise:

- **1) lowers blood levels of glucose and improves insulin senstivity.**
- **2) affects the release of corticosteroid hormone.**
- **3) increases anti-inflammatory cytokines.**
- **4) enhances the expression of insulin receptors on cancer-fighting T cells.**

- **5) promotes interferon production.**
- **6) improves the metabolism of vitamin C.**
- **7) enhances functions of the white blood cells.**
- **8) increases cytotoxic activity of natural killer cells.**

Exercise Guidelines:

- There is no special exercise prescription.
- Aerobic and anaerobic exercises have to be combined with more focus on aerobic activity.
- Instead of doing strenuous bouts of continuous exercise, it is better to perform low-to-moderate aerobic activity several times a day.

- **There is a direct relation between increased physical activity and improved health and functional capacity.**

When recommending exercise to cancer survivors, keep in mind the following variables:

- **Frequency.**
- **Intensity.**
- **Type of exercise.**
- **Duration.**
- **Progression.**

Exercise Variable	Guidelines
Frequency	Depending on their physiologic reserve, at least 2-4 times/week; daily activity for patients with low Karnofsky scale or high ECOG grade.
Intensity	Depends on their fitness levels: usually 50-70% VO2 max, or 60-80% MHR.
Type	Focus on large muscle group activity, especially walking .
Duration	Maximum duration of 20-30 minutes per session, several times a day, with adequate interval rest.
Progression	Results may not be evident at the beginning. General wellbeing counts.

2) Smoking cessation:

- **Smokers have 1 in 3 lifetime risk of dying prematurely from smoking-related cancer or cardiopulmonary diseases.**
- **Tobacco – related cancers are:**

- **Lung.**
- **Larynx.**
- **Oropharynx.**
- **Esophagus.**
- **Kidney.**
- **Bladder.**
- **Pancreas.**
- **Stomach.**

- **3) Diet Modification:**

- **Low fat diets: diets high in fats increase the risk of cancer.**

- **Fiber: high fiber diets may lower the risk of colon, breast and prostate cancers.**

- **Calcium: this mineral lowers colon cancer risk, as it binds bile and fatty acids.**

- **Limit/eliminate sugars.**

- **Micronutrients deficiencies such as vitamins C and E, selenium, beta-carotene and phytoestrogens may increase the risk.**

- **Limit/eliminate additives, preservatives and food colorings.**

- **Nitrates and nitrites: found in preserved and smoked meats suck as ham, bologna, salami, corned beef, hot dogs, and bacon. They may convert to carcinogenic nitrosamines.**

- **Limit/eliminate pickled or salt-cured foods.**

- **Limit /eliminate saccharin:** an artificial sweetener that has been linked to bladder cancer.

- **Barbecuing:** produces **benzopyrene**, which is a mild carcinogen. It is a polycyclic aromatic hydrocarbon that is produced by incomplete combustion of fuel and organic substances.

- benzopyrene is generated during dry heat cooking methods such as barbecuing, roasting and grilling of fat and protein.

Three Common Cancers:

- **Breast Cancer.**
- **Colon Cancer.**
- **Prostate Cancer.**

Breast Cancer:

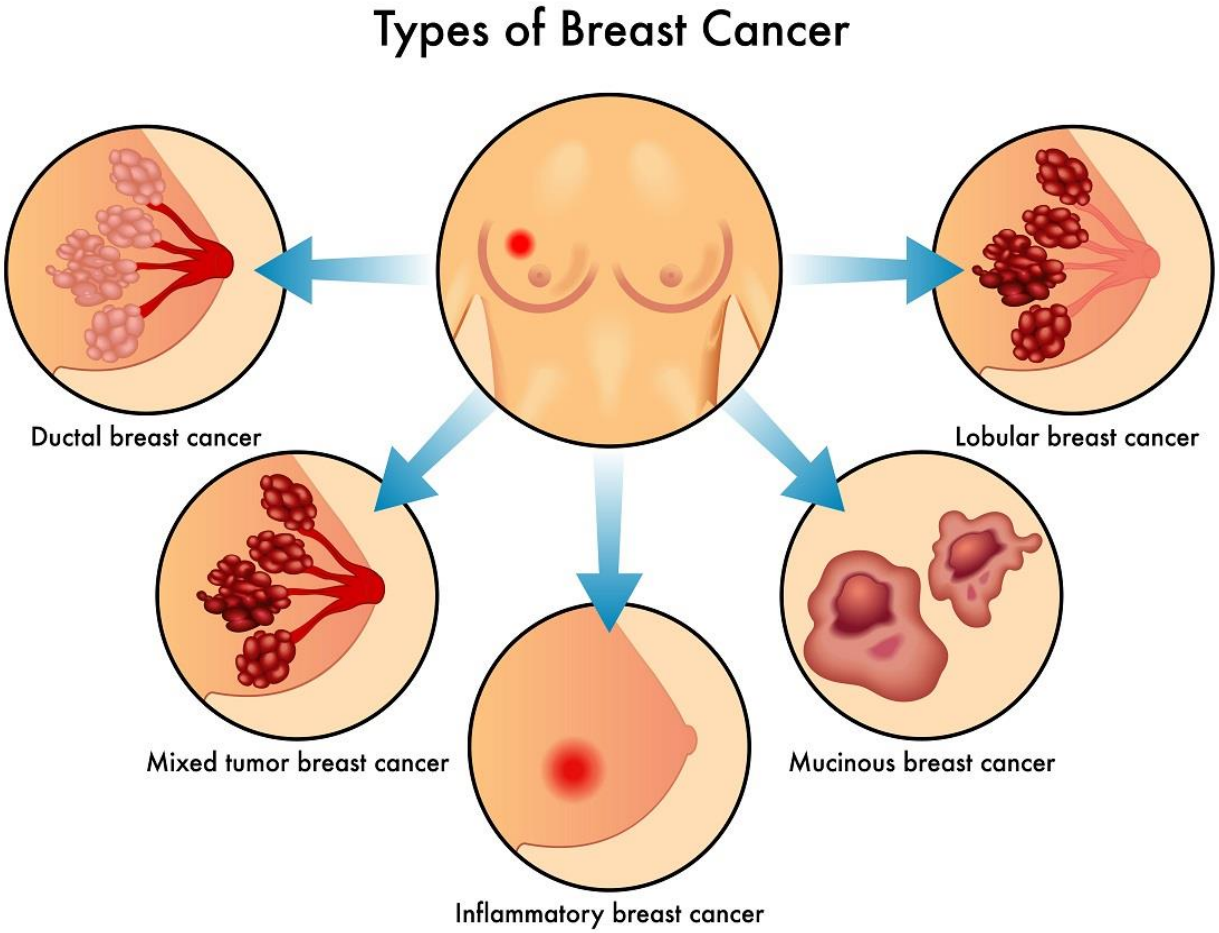
- **Is the most common cancer in women.**

- **Breast cancer is a malignant growth of epithelial cells lining the ducts or lobules of the breast.**

The most common cancer in women is breast cancer.

Image: Copyright©Depositphotos.com/Rudyanto Wijaya

- **Majority of people with breast cancer is discovered by a painless lump in the breast.**



Other signs and symptoms are:

- **pain in the breast**
- **skin dimpling**
- **changes in skin color or texture**
- **clear or bloody discharge from breast**
- **erosion or retraction of the nipple**
- **redness and diffuse enlargement of breast**
- **enlargement of lymph nodes in the armpit**
- **mammographic changes.**

- **Breast cancer is very rare in men, and the female-to-male ratio is 150 to 1.**

Potential risk factors and causative agents are:

- 1) Early menarche (first menstruation before age 12 years old).
- 2) Late menopause (menopause after age 52 years old).
- 3) First full term pregnancy after age 35 years old.
- 4) Nulliparous women (those who have never given birth a baby).
- 5) Genetics.
- 6) Age.

- **7) Race (more common in white women than black).**
- **8) Hormone replacement therapy.**
- **9) Alcohol.**
- **10) Smoking.**
- **11) Environmental factors: exposure to herbicides, pesticides, power lines, and radiation.**
- **12) Lack of exercise.**
- **13) Obesity.**

- **14) Nutritional factors:**

- Low fiber diet.

- Diets high in saturated fats.

- Decreased intake of antioxidants.

- Insufficient intake of Omega-3 fatty acids.

- Increased calorie intake.

Restricted Foods:

- Refined sugars and sweets.
- Saturated fats.
- Trans-fats.
- Fried foods.
- Processed foods.
- Alcohol.
- Food additives and preservatives.
- Dairy products.

Recommended Foods:

- **Drink plenty of water: at least 2 liters a day.**
- **Whole grains.**
- **Foods high in fiber: lentils, beans, avocado and artichoke.**
- **Foods high in Omega-3: fish, flaxseed, hemp seed, chia seeds, and walnuts.**

- **Fresh fruits and vegetables.**

- **Vegetables high in Indole-3-carbinol: broccoli, cabbage, cauliflower, Brussels sprouts, kale and collard greens. *Indole-3-carbinole may reduce the risk of developing estrogen-related breast cancer by altering the metabolism of estrogen.***

- **Foods high in flavonoids: berries and red grapes.**

- **Foods high in phytoestrogens:**

  a) High in lignans: flaxseed (the highest amount), sesame seeds, sunflower seeds, nuts (pistachios, almonds, walnuts, cashews and hazelnuts), oatmeal, rye, barley, wheat, legumes (lentils, navy beans, kidney beans, pinto and fava beans), soybean, alfalfa sprouts, cabbage, asparagus, green pepper, broccoli, cucumber, apricots, strawberries, peaches, raspberries, and dried prunes.

  b) High in coumestans: alfalfa sprouts, lima beans, pinto beans, and split peas.

c) **High in isoflavones:** soybeans, soy products (tofu, tempeh, and miso), alfalfa sprouts, green beans, chick peas, and peanuts.

- Garlic.
- Basil.
- **Foods high in folic acid:** green leafy vegetables.
- Maitake mushroom.
- Ginger.
- Turmeric.
- Sumac.
- Green tea.
- Chamomile tea.

Recommended Supplements:

- **Folic acid:** 1000 mcg. Folic acid reduces risk of breast cancer in women who consume alcohol.

- **Co-Enzyme Q 10:** 300 – 600 mg a day. It is a powerful antioxidant that has a protective effect on breast cancer. To enhance absorption, it should be taken with meals.

- **Omega – 3 fatty acids:** 3 – 10 grams a day.

- **French Maritime Pine Bark Extract: 200 – 300 mg a day. It is a potent antioxidant that has an immune-enhancing effect.**

- **Grape seed extract: 50 – 100 mg a day.**

- **Indole – 3 – Carbinol: 300 – 600 mg a day. It alters metabolism of estrogen.**

- **D – Glucarate: 500 – 1000 mg a day. This product helps the liver detoxify and excrete excess hormones by blocking the enzyme B-glucuronidase.**

- **DIM (Di Indole Methane): 100 – 200 mg a day. It assists the liver in estrogen breakdown.**

- **Melatonin: 6 – 18 mg a day. Melatonin has an anticancer activity against breast cancer especially in those who have night shift works.**

- **Vitamin D: 2000 – 5000 IU a day.**

- **Curcumin: 1000 – 1500 mg a day. It has detoxifying, anti-inflammatory and anti-cancer activities.**

- **Aloe Vera juice (containing no aloin): ¼ to ½ cup three times a day.**

- **Maitake mushroom: 600 – 1200 mg a day or Maitake D-Fraction: 6 to 12 drops of liquid per day. The active ingredient in maitake mushroom is β-D-glucan and has shown promising results against cancers especially breast and prostate cancers.**

- **Chrysin: 500 – 1000 mg a day. This is a flavone that may lower estrogen level by inhibiting aromatase enzyme.**

- **Resveratrol: 200 – 400 mg a day. It is a powerful antioxidant with an anti-cancer activity.**

- **Spirulina:** **as a tablet: 2000 – 3000 mg a day, or as a powder: 2 – 3 teaspoons a day. Spirulina has anti-cancer, detoxifying, immune-boosting and alkalinizing properties**

- **Digestive enzymes:** **A full spectrum product.**

- **Probiotics:** **a product that provides 10 to 20 billion organisms per serving.**

Miscellaneous Suggestions:

- **Liver detoxification.**
- **Colon cleansing.**
- **Ketogenic diet.**
- **Exercise.**

Homework:

- **1) Describe your dietary modification for a patient with a cancer.**

- **2) Describe your supplementation protocol for breast cancer.**