

CANCER

Neoplasm- a new and abnormal formation of tissue forming a tumor that grows at the expense of the healthy tissue. The growth is often rapid and demands the nutrients, which would normally feed the regular tissues of the organism. This is why cancer is considered a wasting disease; the body starves to feed the cancer. Other wasting diseases are tuberculosis, AIDS, malaria, and pituitary gland diseases.

Types of Cancers

- **Sarcomas-** develop from the connective tissues; blood, bone, cartilage and proper connective tissues such as adipose, areolar, dense regular or irregular
- **Carcinomas-** develops from epithelial tissue such as the mucous linings of the digestive tract or the epidermis of the skin.

Stages of Cancer Development

- **Initiation:** alteration of the cell DNA resulting in a gene alteration. Causes may be physical force, chemical or biological agent assaulting the cell.
- **Promotion:** long term exposure to agents causing the altered gene to be expressed. If exposure to the promoter is reduced the body has time to repair the altered gene but if exposure to the promoter is increased the chances of developing cancer are enhanced.
- **Metastasis:** The seeding or the spread of the cancer cells to distant sites in the body

Dietary Links to Cancer

- **FAT:** Slows the time food is in the intestinal tract thus leading to promotion of cancer; linked to colon cancer.
- **ALCOHOL:** Increases the turn over of liver cells thus the link with liver cancer. May also be a promoter in colon and esophageal cancers.
- **PICKLED AND SMOKED FOODS:** The tar on the surfaces of these food, like the tar found tobacco smoke, this substance is a promoter of stomach and esophageal cancer.

Dietary Protective Nutrients

- **Vitamin A and Carotene:** May boost the immune system and may control cell differentiation may reduce cancer of the larynx, lung esophagus, bladder and the breast.
- **Vitamin C:** Associated in the reduction of stomach and esophageal cancer
- **Vitamin E and Selenium:** Antioxidants, which protect the cell from breakdown.
- **Calcium:** May reduce cell turnover. Seems to reduce colon cancer

Nutrition for the Cancer Patient

Cachexia: A state of malnutrition and wasting. This condition affects 1/3 to 2/3 of cancer patients.

Cancer and Metabolism

Cancer patients have an impaired ability to metabolize carbohydrates with insulin resistance a common problem (insulin allows the cell to use glucose). When the cells cannot use glucose as an energy source they must look to first lipids, and then to proteins, for their energy, leading to the breakdown of fat and muscle.

Energy needs for the cancer patients is often 1 1/2 to 2x that of resting energy. Protein needs increase, as does the need for folic acid, which is used in the cancer cell's rapid reproduction.

Common Problems of The Cancer Patient

- **Anorexia:** Unexplained weight loss without a change in diet or exercise is due to the increase of lipid and protein metabolism. A decrease in serum albumin may indicate the catabolism of body tissues.
- **Early Satiety and /or Loss of Appetite:**
Maybe due to:
 - Physical pressure from the tumor or the build up of fluid in the interstitial spaces (ascites)
 - Taste alteration with increased sensitivity to sweetness and meats such as pork and beef appearing to have a metallic taste (often caused by medication)
 - Decrease in saliva causing difficulty in swallowing.
 - Nausea, Vomiting and Diarrhea, maybe due to the cancer but is often a result of the chemo or radiation treatment associated with the cancer.

Cancer of the small intestine, colon or rectum

Cancers of small intestine rare, cancer of the large intestine more common

- Predisposing factors
- Genetics
- Chronic ulcerative colitis
- Ingestion of food additives
- High fat/ low fiber diet
- More common in males over fifty years
- Signs:
 - Subjective:
 - Abdominal discomfort
 - Abdominal pain
 - Weakness and fatigue
 - Objective
 - Alteration in bowel functions
 - Abdominal distention
 - Weight loss
 - Frank or occult blood in stool
 - Palpable mass
 - Proctosigmoidoscopy visualizes a mass
 - Pathology shows malignant mass
 - Elevation in CEA – mostly used to monitor for recurrence post surgical removal of cancerous colon
- Assessment
 - Description of stool
 - Baseline weight
 - Areas of abdominal discomfort
 - Bowel sounds

Liver Cancer

- Primary cancer is rare in this organ in the U.S. Maybe caused by exposure Mycotoxins like the mold found on peanuts and grains. Also hepatitis and cirrhosis may lead to cancer.
- Cancer can arise from the ducts or from the hepatocytes
- Onset can be slow or abrupt
- The cellular type is often associated with the cirrhosis.
- Metastases to heart, lungs, then spleen, kidney and brain
- Symptoms:
 - Nausea and vomiting, feeling of fullness and pressure (upper right)
 - Increase in portal hypertension leading to ascites
 - In later stages increase in pain, weight loss, and loss of appetite
 - Jaundice and hemorrhage

Reproductive Cancers

Breast cancer

- Adenocarcinoma originating in the mammary ducts and lobe
- Often manifested as hard nontender fixed nodule
 - Late stage → “orange peel” appearance
- Tumors maybe estrogen or progesterone receptor positive
- Usually located in the upper outer quadrant of the breast
- Site of metastasis: bone, bone marrow, liver, lung, brain and soft tissue
- **Factors that increase risk**
 - Increased age
 - Longer exposure to estrogen / Estrogen replacement therapy
 - Heredity
 - Menarche before 12/ menopause after 55
 - Nulliparity or first child after 35
 - Diet
 - High fat
 - Selenium deficient
 - Alcohol consumption
- **Clinical findings**
 - Objective:
 - Palpable mass
 - Change in symmetry of breast/ inversion or discharge from nipple
 - Enlargement of the axillary lymph nodes
 - Dimpling and change in color of the skin in affected area = “orange peel”
 - Positive
 - Mammogram findings
 - Sonogram
 - Biopsy
- Estrogen receptor assay
- Tumor marker, Marker found in serum indicates presence of cancers. Marker of concern Ca15-3 and CEA
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- **Therapeutic intervention**
 - Surgical:
 - Partial mastectomy- removal of lump and surrounding breast tissue
 - Simple mastectomy- removal of breast only
 - Radical mastectomy-removal of breast, pectoral muscles, all regional lymph nodes
 - Modified Radical mastectomy-removal of breast but pectoral muscles are left
 - Radiation- to reduce lesion and limit metastases
 - Chemotherapy – tamoxifen = estrogen receptor blocker for estrogen-dependent cancers
 - Bone Marrow Transplant

Cancer of the cervix

- Malignant changes in the tissue at the opening and neck of the uterus
- High cure rate if diagnosed early
- Site of metastasis: bone, liver, and lung,
- **Factors that increase risk**
 - Multiple sex partners / STDs
 - DES daughters exposure in utero
- **Clinical Findings**
 - Objective
 - Spotting between periods and after intercourse
 - Vaginal discharge
 - Lengthening of time between periods
 - Pap smear shows precancerous or cancerous cells
- **Therapeutic interventions**
 - Internal or external radiation
 - Laser surgery
 - Cryosurgery
 - Removal of a cone section of the cervix-preserves reproductive function
 - Surgical-hysterectomy or panhysterectomy (All reproductive organs)