Diet in cancer

When good cells go bad
What is cancer?

- Cancer means “Crab” for the creeping way in which it spreads

- It is a general term for more than 100 types of malignant neoplastic disease
Cancer not a single disorder

- Many types
- Different characteristics
- Occur in different body locations
- Require different treatments
Cancer Development

• Genes work together to regulate cell division and ensure new cells are replicas of parent cells

• Process allows:
  - Body to grow
  - Replace dead cells
  - Repair damaged cells
• Cancer develops from mutations in genes regulating cell division
  – Mutations inhibit genes that ordinarily monitor and correct errors
  – Affected cells lose ability to stop cell division
• Result is an abnormal mass of cells
• An abnormal mass of cells is called a tumor

  – **Benign**
    
    • Tumors that stop growing without intervention or can be surgically removed
    
    • Most often pose no threat to health

  – **Malignant**
    
    • Tumors that multiply out of control
    
    • Threaten surrounding tissues and health
Cancer Development

Carcinogen → Initiation → Promotion → Tumor formation

Normal cells → Initiators begin the process of changing the DNA in some of the cells. → Promoters enhance the development of abnormal cells.

Noncancerous (benign) tumor → Malignant tumor releases cells into the bloodstream (metastasis)

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Risk factors

Genetic

Dietary

Physical activity

Immune

Environmental
Dietary Factors Cancer Initiators

• Pesticides
  – Some pesticides may be carcinogenic at extremely high doses, however, they are safe at the levels permitted on fruits and vegetables
  – The benefits of eating fruits and vegetables are far greater than any potential risk

• Food additives
  – Those approved for use in foods are not carcinogenic
• Alcohol
  – Alcohol associated with increased risk of mouth, esophageal and breast cancer
• Mouth and esophageal cancer are especially increased if alcohol is combined with smoking
• If alcohol intake causes liver cirrhosis, there is an increased risk of liver cancer
Food preparation methods

– Cooking meat, poultry, and fish at high temperatures and smoking meat causes carcinogens to form on food surfaces which have been related to cause cancer
  • High heat cooking methods such as grilling, broiling, and barbecuing

– Healthier cooking methods include roasting, broiling, poaching, steaming, stewing, braising and microwaving

– Fruits and vegetables appear to provide a protective effect
Dietary Factors: Cancer Promoters

• High fat diets
  – High dietary total fat and saturated fat may be related to increased risk of breast, colon, endometrial and prostate cancer

• Omega-3 fatty acids however, may be protective
  – Thus same dietary fat advice applies to cancer protection as to heart disease

• Reduce total fat and saturated fat
• Increase omega-3 fatty acids
High fat diets

- May increase cancer risk by increasing:
  - Obesity
  - Bile acid production
  - Estrogen levels

- Because fat is calorie dense it is difficult to distinguish between the effects of high dietary fat, and total calories
• High calorie intake
  – In most epidemiologic studies, a positive association has been seen with high calorie intake and promotion of breast, colon and endometrial cancer
  – Increased risk may be due to:
    • Excess calories themselves
    • Weight gain due to excess calories
    • High fat intake that often supplies excess calories
Protein

- Excessive muscle meat sources of protein have been related to increased risk of colon and prostate cancer

- In general, tumor development is:
  - Suppressed by diets that contain protein below that required for optimal growth
  - Enhanced by protein levels two to three times the amount required
Dietary Factors: Protective Factors
Fruits & vegetables

- Reduce the risk for cancers of the oral cavity, esophagus, stomach, colorectum
  - Compounds in these foods that may help lower cancer risk:
    - Dietary fiber
    - Vitamin C
    - Vitamin E
    - Phytochemicals
    - Low fat
• High fiber diets helps to protect colorectal cancer

• Fiber has been diluting potential carcinogens & speeding their transit through the colon

• Foods high in fiber are typically lower in fat which help to protect against colon cancer by reducing bile acid production
• Evidence suggests millions of cases of cancer could be prevented by changes in
  
  – Diet
  – Weight control
  – Physical activity
  – Smoking
Cancer treatments

- Primary medical treatments are aimed at removing cancer cells, preventing further tumor growth, and alleviating symptoms.

- Surgery
- Chemotherapy
- Radiation therapy
Nutritional care

• A cancer patient needs a high calorie, high protein diet

• Cancer causes a hypermetabolic state

• Without adequate nutrients body is poorly equipped to maintained immune defenses

• Support organ function, absorb nutrients and mend damaged tissues
• ENERGY: For an adult with good nutritional status about 2000 kcal & for

• Malnourished patient about 3000-4000 kcal or 45-50 kcal/kg body weight may be recommended

• PROTEIN: For an adult with good nutritional status about 80-100g may be recommended or

• 1-1.2g/kg for those with good nutrition

• 1.3-2g/kg for malnourished patients
• Vitamins & minerals
Optimal intake are recommended. There are mounting evidence that vitamins protect against several types of cancer

• Fluid: sufficient fluids need to be ingested
Conclusion

• Cancer clients often present difficult nutritional challenges

• Both the disease & its treatment can cause early satiety & anorexia, taste alterations, local effects in the mouth, nausea, vomiting, diarrhea & altered immune responses

• Creative interventions for these problems help make the client’s life more comfortable