Nutrition Considerations of Oncology Patients

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Objectives

• Understand nutritional problems associated with cancer therapies and nutrition considerations

• Identify patients at high nutritional risk

• Describe 2 nutrition considerations in supporting immune function
Nutrition not only plays a role in cancer treatment, it plays a vital role in cancer process:

From Initiation to Promotion to Progression

Therefore, nutrition is crucial in long term survival

Nutrition Problems Associated with Cancer Treatment

- Nausea/vomiting
- Soreness of mouth and/or throat
- Constipation, diarrhea, gas, bloating
- Loss of appetite and/or Taste alteration
- Anemia
- Fatigue
- Mal-absorption and micronutrient deficiencies

Other Factors Impact Nutrition

- Treatment related side-effects
- Fatigue
- Depression
- Fear
- Anxiety
- Lack of Social Interaction
- Financial
- Pain
Nutrition Goals

• Improve Nutritional status, and thus immune competence
• Increase potential for a favorable response to therapy
• Decrease potential side effects of the therapy
• Maintain body weight and lean body mass
• Improve/enhance recovery from treatment
• Improve quality of life and Survival

Nutrition Approach to Ca Treatment

<table>
<thead>
<tr>
<th>Traditional Approach</th>
<th>Paradigm Shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eat regardless the source</td>
<td>Nourishment/Functional Foods/phytonutrients</td>
</tr>
<tr>
<td>• High Calorie</td>
<td>• Balanced Diet</td>
</tr>
<tr>
<td>• High Protein</td>
<td>• Lean Protein/AA</td>
</tr>
<tr>
<td>• High Fat</td>
<td>• Good Fats/Omega 3’s</td>
</tr>
<tr>
<td>• Weight Gain</td>
<td>• Maintain Body Weight</td>
</tr>
<tr>
<td>• (SAD)</td>
<td>• Vitamins, mineral and dietary supplementation</td>
</tr>
<tr>
<td>• No supplements -- fear of interference with treatment</td>
<td>• Exercise</td>
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<tr>
<td>• Rest</td>
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</tbody>
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Tips in Managing Treatment Related Side-effects

• Nausea—
  - Ginger
  - High Protein


• Diarrhea—
  - Electrolyte repletion
  - Rice congee
  - Probiotics
  - Soluble fiber
  - Glutamine (?)
  - Room Temp. food

• Lack of Taste—
  - Zinc
  - Iron
  - various spices/herbs

• Wound Healing—
  - Protein, A, C, E, Zn
Tips in Managing Treatment Related Side-effects

- **Neuropathy**—
  - Glutamine
  - Alpha lipoic acid
  - Acetyl-L-Carnitine (CNS Drugs. 2007;21 Suppl 1:39-43)
  - Acupuncture
  - Exercise

- **Involuntary Weight Loss**—
  - Omega 3 fish oil
  - HMB, Arginine, and Glutamine (Juven®)

Specific Nutrition/Lifestyle Considerations:

- Maintain Hydration Status
- Maintain Body Weight (< +/-5%)
- Adequate Protein Intake
- Healthy GI Tract
- Functional Foods
  - Phytonutrients
  - Essential Fatty Acids
  - Amino Acids
  - Probiotics
- Vitamin and mineral supplement
- Exercise

Maintain Hydration: Fluids

2% weight loss → dysfunction/dehydration
- Headache, anorexia, nausea, dark/low urine
- Dehydration: Cells can’t work well as wilted plants
- Exacerbates fatigue, pain, nausea, constipation
- Fluids clear toxins
- Daily Needs: Body Weight (lb) ÷ 2 = oz/day
- Post chemo for 3-5 days
  - Mix it up! Soups, fruit juices, protein shakes, smoothies, watermelon, tea, water, etc.
  - (electrolyte repletion)
  - Non-caffeinated is better; limit caffeine to 2 cups/day
Fluids – Post Chemo

Body Weight (lb) ÷ 2 = oz/day

Example:
(160 lb ÷ 2 = 80 oz/day)

Maintain Body Weight

• < 5% weight loss or weight gain

Cancer Related Malnutrition

Increased Infection Rate

Increased Hospitalization & Prolonged Stay

Reduced Performance Status

Poor Treatment Response / Tolerance

Decreased Quality of Life

Increased Cost

Increased Mortality (60-80% mortality)

Seligman, et al, JAMA 1980;243:1523
Ottery, Seminars in Onc 1995
Clin Nutr. 2007;26:289-301
High Risk

- 5% Body weight loss in one month (or)
- 10% Body weight loss in six months
- Albumin is less than 3.2

Obesity and insulin resistance may be a high-risk state for disease progression among cancer survivors

The American Cancer Society estimates that one-third of the more than 572,000 cancer deaths in the USA each year can be attributed to diet and physical activity habits, including overweight and obesity, while another third are caused by exposure to tobacco products. Exposure to tobacco products.

Mortality from Cancer According to BMI for U.S. Women in the Cancer Prevention Study II

Cancer Prevention Study II
Healthy Gut

- Easily compromised by treatment
- Contains 70-80% immunologic secreting cells
- Almost 50% of mass of immune system lines the gut
- Of healthy people, 40.5% report 1 or more digestive complaint

Healthy Gut—crucial during treatment

- Prevent malabsorption
- Increase nutrient absorption
- Prevent bacteria overgrowth
- Support Immune System

Support During Treatment:
- Amino Acids – L-glutamine
- Probiotics
- Fiber (prebiotics)
- Hydration
Maintain a Healthy GI Track

- **Glutamine**
  - Decrease incidence of severe mucositis
  - Enteral support to parental nutrition
  - Essential for chemo and xrt related enteritis

- **Probiotics**
  - Improves host intestinal microbial balance
  - Stimulate innate immunity of the host
  - Increase resistance to pathogens, infection, and inflammation
  - Enhance nutrient synthesis and bioavailability

Healthy Intestinal Bacteria affected by:

- Tumor invasion
- Chemotherapy
- Radiation therapy
- Surgery
- Prolonged use of antibiotics
- Aging, refined diet, alcohol intake

Nutritional and Therapeutic Effects of Probiotics

- Nutrient synthesis and bio-availability
- Reduce recurrence of yeast and bacterial infections, e.g. C-diff.
- Maintain gastrointestinal track health, crypt cells and villi height
- Reduce chemo and radiation related diarrhea
- Stimulate innate immunity of the host
- Possible colon and breast cancer prevention (?)
Probiotics:

- Examples: acidophilus, lactobacillus, Bifidobacterium, Streptococcus, Saccharomyces
- Food Sources: yogurt, butter milk, miso, kefir, sauerkrauts, kimchee, etc.
- Supplements—Culturelle®, Align®, VSL-3®, Florastor®, etc.

Prebiotics—Just having probiotics is not enough

- Not all probiotics will survive
- Non-digestable substances (FOS, inulin, lactulose) that feed probiotics
- Releases SCFA → decrease colon PH → enhance mineral absorption (Ca, iron, Mg)
- Decreases some pathogenic bacteria

Supplements:
- Fiber Choice®
- Fibersure®
- Metamucil Clear and Natural®

Dietary Sources:
- Asparagus, Banana
- Onion, Garlic, Flax
- Legumes, Barley, etc.

Specific Nutrition Considerations:

Functional Foods

- Amino Acids – L-Glutamine
- Probiotics
- Essential Fatty Acids
- Phytonutrients Phytochemicals
Key Points About Fat In The Diet

Dietary Fats

- Saturated Fat
- Trans Fats
- Polyunsaturated Fat (PUFAs)
- Monounsaturated Fats

Limit These Fats
- Animal fats (e.g., butter, cream, lard)
- Margarine

Eat These Fats
- Vegetable oils
- Nuts
- Seeds

Omega 6 vs. Omega 3

Omega 6
- Vegetable oils, hydrogenated fats
- Pro-inflammatory
- Alter estrogen metabolism
- Suppress immune function
- Promote cancer cell proliferation
- Stimulate tumor vascularization and metastasis
- Omega 6 rich diets were associated with a relatively poor prognosis in breast cancer patients

Omega 3
- Fish/fish oil, flax oil, and wild game
- Anti-inflammatory
- Increase tumor suppressive gene – P53
- Influence insulin sensitivity and membrane fluidity
- Slow cell division; thus tumor growth rate
- Less aggressive tumor
- Improves cachexia
- Decrease blood clot
- Lubricate the skin

Functional Foods:
Phytonutrients / Phytochemicals

Naturally occurring plant compounds (fruits, vegetables, and whole grains)

- Antioxidants—scavenge “free radicals”
- Detoxifiers / Neutralizers—destroy and eliminate toxic components
- Hormone Modulators—alter hormone production favorably
- Cell Regulators—control rampant cell growth
Plant-based Diet

- Antioxidants: Carotenes, polynenols, tocopherols, vitamin C, etc. (yellow, orange, dark leafy greens, cocoa, tea, citrus..)
- Anti-inflammation: Omega 3 fats (EPA,DHA), flaxseeds, turmeric, rosemary, oregano, green tea, red wine, berries
- Anti-carcinogens: Cruciferous (increases detox phase II enzyme), curry, green tea, pomegranate, citrus, brazil nuts,

Be Colorful

- Include varieties of fruits, vegetables, whole grain and legume
- Incorporating spices and herbs in cooking
- Eat > 2 types of vegetables at a meal

Goal:
- 8-10 servings vegetables & fruits/day
- > 3 servings whole grain and legumes

Specific Nutrition Considerations: vitamins and mineral supplement

- Pre-existing nutritional deficiencies prior to diagnosis
- Adverse side effects of treatments on GI track
- Treatment or disease state induced deficiencies (zinc, selenium, vitamin C, E, A, etc.)
- Type of Chemotherapy or treatment
- Other medications depleting micronutrients
- Supporting Liver detox pathway
- New research on needs
Specific Nutrition/Lifestyle Considerations:
• Maintain Hydration Status
• Maintain Body Weight (< +/-5%)
• Adequate Protein Intake
• Healthy GI Tract
• Functional Foods
  ▪ Phytonutrients
  ▪ Essential Fatty Acids
  ▪ Amino Acids
  ▪ Probiotics
• Vitamin and mineral supplement
• Exercise

Resources
www.eatright.org
www.oncologynutrition.org (finding an Onc RD)
www.aicr.org
http://cancerdietitian.com/
www.mskcc.org/aboutherb
www.mayoclinic.com
http://nccam.nih.gov/health
www.cancer.gov/cam