Nutrition & Blood Cancer: Questions Answered

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Food is essential for life.
Food is an act of self care.
Food connects us with one another.
Food is one of life’s greatest pleasures.
"I am diagnosed with CLL/SLL. What is the best diet to follow for a lymphoma cancer? I've researched this topic and hear so much conflicting information and even conflicting research about diets. Some recommend a vegan diet, others a paleo or Mediterranean diet. I need help sorting out the conflicting information about a plant based diet or vegan diet and a paleo or ketogenic diet. My goal is to eat a nutrient dense diet and remain as healthy as possible in spite of having SLL. And I would like to keep my cancer stable or decrease the size of the enlarged lymph nodes."
Cancer Nutrition

- Consult with oncology dietitian: *personalized* approach based on your unique situation.
- No single food or nutrient alone has been shown to cause or cure leukemias/lymphomas/myeloma.
- A nutrient dense diet is abundant in cancer protective compounds.
- [Foods that Fight & Plant Based Diet Examples](#)
“Are there any foods or drinks which would increase platelets?”

“What about WBCs?”

“I want to boost my red blood cell count but not gain weight, is red meat or organ meat the best way?”
Nutrition: Platelets & WBCs

• Unfortunately, no known nutrition intervention to improve platelet counts or WBCs.

• Platelets manufactured in the bone marrow:
  • Stimulate production in the long bones through movement:
  • Walking up and down stairs.
Food Safety and Cancer

• Compromised immune system = compromised ability to protect against foodborne illness.
• Consume foods that are low risk.
• Some food is more likely to contain pathogens (Listeria Outbreak in Deli Meat) while others are less likely.
• Food Safety for People with Cancer
Nutrition and Red Blood Cells

• Nutrients involved with building red blood cells:
  • B vitamins, iron, zinc
• Deficiency of nutrients could result in compromised ability to form red blood cells.
• Most often, low counts are not due to a deficiency in nutrients. Either the disease process or treatment is the underlying cause.
# Nutrients & Red Blood Cells

<table>
<thead>
<tr>
<th>Nutrient &amp; Daily Need</th>
<th>Where to find it</th>
<th>Amount</th>
</tr>
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<tbody>
<tr>
<td><strong>Iron</strong></td>
<td>½ cup cooked lentils</td>
<td>120 calories</td>
</tr>
<tr>
<td>Men/women &gt; 50 years old: 8 mg</td>
<td>½ cup firm tofu</td>
<td>90 calories</td>
</tr>
<tr>
<td>Women &lt;50 years old: 18 mg</td>
<td>3 oz. lean beef</td>
<td>160 calories</td>
</tr>
<tr>
<td><strong>Folate</strong></td>
<td>½ cup black eyed peas</td>
<td>105 mcg</td>
</tr>
<tr>
<td>400 mcg</td>
<td>½ cup cooked spinach</td>
<td>130 mcg</td>
</tr>
<tr>
<td><strong>Vitamin B12</strong></td>
<td>3 oz. rainbow trout</td>
<td>5 mcg</td>
</tr>
<tr>
<td>2.4 mcg</td>
<td>1 Tbsp. Nutritional Yeast</td>
<td>7.5 mcg</td>
</tr>
<tr>
<td><strong>Zinc</strong></td>
<td>3 oz. oysters</td>
<td>74 mg</td>
</tr>
<tr>
<td>1.3 mg</td>
<td>1 oz. pumpkin seeds</td>
<td>2.2 mg</td>
</tr>
</tbody>
</table>
• Discuss with medical team if a nutritional deficiency is suspected. If you are losing weight or have a poor appetite: seek a nutrition consult.
• Do not take an iron supplement unless recommended by medical professional.
• Consume a balanced diet that also contains sources iron, zinc, and B vitamins.
“Are vitamins & minerals helpful while on treatment?”

“How do I eat enough vitamins & minerals in natural foods?”
Dietary Supplements

Vitamins and Minerals are *micro-nutrients*.
More does not = better.
The “Goldilocks Effect”: just the right amount.
Get Nutrition from **Food 1st & Supplements 2nd**.
Food vs. Dietary Supplements

- Research shows: dietary supplements do not offer the same benefits as eating whole foods.
- Whole foods provide a “package of nutrients”. Our bodies absorb a range of vitamins, minerals, and antioxidants that work together to protect our health.
Food 1st Approach

• Synergy exists with the package of a whole food.
• “1 + 1 = 3 Concept”
• A dietary supplement has isolated from a food, and research suggests it may not be absorbed as well as natural foods.
Dietary Supplements In Cancer

• Mixed results from research: overall not likely to improve prognosis or overall survival.
• ACS and AICR recommendation: Do not rely on dietary supplements for cancer protection.
• If taking a Multivitamin, choose one with 100% Daily Value or less.
Dietary Supplements in Cancer

- **Vitamin C** given before anti-neoplastic agents weakened their efficacy against leukemia and lymphoma cell lines.
- Too high a dose can be detrimental.
- **Low vitamin D status** associated with reduced survival in those with Multiple Myeloma.
Dietary Supplements: Bottom Line

• Discuss any use of dietary supplements with your medical team: Not without risk!
• Can interact with treatment, Rx, and OTC products.
• Consider evaluating vitamin D levels through bloodwork to decide if a supplement is advised.
• Experts state that a prudent diet can supply the essential nutrition we need for health.
Nutrient Dense Eating

• **Nutrient Dense Food**: containing a significant amount of vitamins, minerals, phytochemicals, antioxidants with a relatively low amount of calories.
• Examples:
  • Vegetables, fruit, whole grains, beans/lentils, nuts/seeds that are minimally processed.
SAD Diet: Standard American Diet

Recent research suggests:
- Cancer survivors eat a “poor quality” diet.
- Low in whole grains, greens & beans, omega 3 fats.
- High in sodium and saturated fats.
Nutrient Density in Nourishing Plates

- Fill one-quarter of your plate with a healthy protein source.
- Fill one-quarter of your plate with a healthy grain or starch.
- Fill half of your plate with non-starchy vegetables.

- Chicken, corn, carrots, and green beans
- Black beans, quinoa, and grilled vegetables
- Black-eyed peas, yams, and collard greens
- Chicken, Spanish brown rice, and nopales
- Fish tacos with corn tortillas, cabbage, and salsa
“How do I lose weight in a healthy way?”

“What about Weight Watchers?”

“How do I lose more after a plateau?”
Healthy Weight

- Classified by: Body Mass Index (BMI) & Ideal
- These methods have flaws.
- Possible to be “normal weight“ and unhealthy or “overweight“ and healthy.
- *Body composition* measurements provide a comprehensive evaluation:
  - Waist circumference
  - Body fat percentage
Healthy Weight

- Obesity associated with increased risk:
  - Multiple Myeloma, Breast, Colorectal, Pancreas, Kidney, Stomach, Liver, Thyroid Endometrial, Esophageal, Ovarian, Gallbladder
- Cardiovascular disease, Diabetes, Alzheimer’s Dz., early mortality
- May be safely pursued during active/maintenance treatment. Check 1st!
Pursuing A Healthy Weight

• Realistic, sustainable: ½-2 lb. per week for 6 months, then reassess if a plateau occurs.
• Moving more, eating better in a healthy lifestyle:
  • Improving nutrient density in meals
  • Controlling portions
• When a plateau is reached: Increase activity and/or eat most of your calories earlier in day.
• Programs such as Weight Watchers promote this overall approach.
Weight Loss for Wellness

- Integrative program lead by Licensed Counselor and Oncology Dietitian
- Based on mindfulness: reduce emotional eating, stress reduction, address mindless eating.
- Commitments made to group, discussion of variety of topics, and introduction of tools to create success.

Weight Loss for Wellness At Cancer Wellness Center
“What about Keto?”
Ketogenic Diet

- Very low in carb, moderate in protein, high fat.
- Carbs provide our bodies with an efficient fuel source. All cells, cancer and non-cancer cells like to use carbs for fuel.
- Ketones are produced as an alternative source of fuel from breaking down fat stores.
- Initially discovered as a treatment for pediatric epilepsy.
Ketogenic Diet Concerns

• Cancer cells have “metabolic flexibility”.
  • Adapt and conquer: use any fuel source available.
• Research has shown cancers use ketones for fuel: subtype of DLBCL
• The only exception for a Keto diet may be for a rare type of brain tumor: Glioblastoma
Effect of the Ketogenic Diet on Cancer

Preclinical studies

- Acute myeloid leukemia: 2%
- Bladder cancer: 2%
- Gastric cancer: 2%
- Uterus cancer: 4%
- Systemic metastasis (Glioblastoma): 4%
- Liver cancer: 4%
- Kidney cancer: 4%
- Melanoma: 4%
- Lung cancer: 6%
- Breast cancer: 6%
- Neuroblastoma: 6%
- Colon cancer: 9%
- Pancreatic cancer: 9%
- Brain tumors: 28%

Proposed effect on tumor cells

- Severe side effect: 2%
- No effect: 17%
- No data on tumor progression: 3%
- Unclear effect: 10%
- Antitumor: 66%
- Protumor: 8%

Clinical studies

- Intraabdominal desmoid tumor: 1%
- Tuberous sclerosis complex: 1%
- Fallopian tube cancer: 1%
- Parotis carcinoma: 1%
- Osteosarcoma: 1%
- Liver cancer: 1%
- Kidney cancer: 1%
- Bile duct cancer: 1%
- Endometrial cancer: 3%
- Gastric cancer: 3%
- Thyroid cancer: 3%
- Melanoma: 3%
- Esophageal cancer: 3%
- Prostate cancer: 4%
- Pancreatic cancer: 6%
- Head and neck cancer: 6%
- Ovarian cancer: 7%
- Breast cancer: 16%
- Brain tumors: 16%
- Colon cancer: 12%
- Colorectal cancer: 12%
- Lung cancer: 12%

Proposed effect on tumor cells

Randomized controlled trials needed
Ketogenic Diet Side Effects and Risks

• Constipation.
• May impair bone health, even short term diet.
• Omits cancer protective compounds in a plant based diet: phytochemicals!
• Contraindications:
  • Anyone with unintentional loss of weight or muscle.
  • Uric acid accumulation: can cause kidney stones
Ketogenic Diet: Bottom Line

To further clarify the mechanisms of the ketogenic diet as a therapy and evaluate its application in clinical practice, more molecular studies as well as uniformly controlled clinical trials are needed.
“What about sugar?”
Sugar and Cancer

• Evaluate if a food is healthy based on type of sugar and the company it keeps:
  - Cookies, soda, refined carbohydrates
  - Nutrient poor, and take the place of cancer protective foods.

• Limit added sugars to 6-10% of calorie intake:
  - 6-9 teaspoons or 24-36 grams per day for women and men, respectively.

37 grams added sugars:
9 teaspoons
Sugar Swaps

Store Bought Dressings & Sauces → Homemade

Soda & Juices → Plain or sparkling water

Cake, pie, ice cream → Local, seasonal fruit

Sugar in baked goods → Applesauce / fruit puree

Sweet yogurts → Plain yogurt & drizzle of honey
Sugar and Cancer: Bottom Line

- Minimize foods with added sugars in favor of nutrient dense choices.
- Cancer cells have demonstrated *metabolic flexibility*.
- Targeting a single pathway has not cured cancer. Likely multiple pathways and treatments are necessary and diets are no exception.
- [Tips on Added Sugars](#)
“How to improve immune function?”

“How does alcohol affect my immune system?”
Nutrition and Immune Function

• Our immune function is a complex balance of many factors.
• Specific nutrients are implicated to support the proper function of immunity.
• The idea of “boosting” immunity is misleading.
<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Where to find it</th>
<th>How much?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Omega 3</strong></td>
<td>3 oz. salmon 1 large egg</td>
<td>500-1200 mg 30 mg</td>
</tr>
<tr>
<td><strong>Vitamin A</strong></td>
<td>½ cup raw carrots ½ cup baked sweet potato</td>
<td>500 mcg 900 mcg</td>
</tr>
<tr>
<td>Men: 900 mcg</td>
<td>Women: 700 mcg</td>
<td></td>
</tr>
<tr>
<td><strong>Vitamin C</strong></td>
<td>½ cup Red bell pepper 1 cup strawberries</td>
<td>120-190 mg 80-100 mg</td>
</tr>
<tr>
<td>90 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vitamin D</strong></td>
<td>3 oz. salmon Fortified products/milk</td>
<td>300-500 IU 80-120 IU</td>
</tr>
<tr>
<td>800 IU</td>
<td></td>
<td></td>
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</table>
## Nutrition and Immune Function

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</tr>
</thead>
<tbody>
<tr>
<td><strong>Vitamin E</strong></td>
<td>1 oz. sunflower seeds 1 oz. almonds</td>
<td>7.4 mg 6.8 mg</td>
</tr>
<tr>
<td><strong>Folate</strong></td>
<td>1 cup lentils 1 cup cooked spinach</td>
<td>180 mcg 130 mcg</td>
</tr>
<tr>
<td><strong>Vitamin B12</strong></td>
<td>3 oz. beef 1 cup milk</td>
<td>3-6 mcg 1 mcg</td>
</tr>
<tr>
<td><strong>Zinc</strong></td>
<td>3 oz. beef 1 oz. cashews</td>
<td>4-9 mg 1.6 mg</td>
</tr>
</tbody>
</table>
Nutrition and Immune Function

- Rely on food 1st to consume immune supportive nutrients.
- Eat to support gut health where the majority of our immune system resides:
  - Probiotics found in fermented foods like yogurt and kefir perform like beneficial bacteria.
  - Prebiotics are special fibers in asparagus, garlic, onion, and bananas are food for the microorganisms in the gut.
Alcohol and Immune Function

Excessive consumption:
>8 drinks for females, >15 drinks for males per week

• Disrupts the normal inflammatory response.
• Directly impacts the cells that protect the lungs and respiratory system.
• Weakens the gut by impacting the beneficial bacteria that are present.
• More likely to develop respiratory infections such as pneumonia.
“Are there foods that will make immunotherapy work better?”
Diet & Immunotherapy

- **Priority during treatment**: Optimize nutrition and hydration to sustain healthy weight.
- The gut microbiome is involved in our immune system response.
- Mounting data that the gut microbiota is involved with mediating the response and toxicity from immunotherapy.
- There may be a more favorable microbiota: type and amount of microorganisms.
Diet Influences Microbiota

Changes in diet can shift towards a beneficial microbiota:

- **SAD Diet** components: processed meat, salty, sugary, fatty foods.
- Minimally processed plant foods to add fiber/prebiotics.
Plant Based Diet & Gut Health

- Minimally processed, whole foods:
  - Whole grains: quinoa, amaranth, bulgur, oats, farro.
  - Vegetables/Fruit: eat the rainbow
  - Beans/lentils: canned, dried, precooked
  - Nuts/seeds: all great choices
- Prebiotics: asparagus, garlic, leeks, onion, barley, bananas.
- Probiotics: fermented dairy, fresh sauerkraut, kimchi, kombucha
“What can I eat to reduce bloating and promote digestive health?”
How to Minimize Bloating

Minimize gas-forming foods:
• Broccoli, cauliflower, Brussels sprouts, cabbage, corn, onions, peas, peppers, garlic, cantaloupe, watermelon, apples, avocado, beans, lentils, nuts

Minimize gas-forming behaviors:
• Eat slowly, minimize chewing on gum, drinking with a straw, or sucking on candy.
Digestive Health Checklist

• The gut likes a routine of meals and snacks.
• \textit{Gradually} add more fiber:
  • Oats, beans, bananas, asparagus, garlic and onions
• Drink plenty of fluids to help digest fiber.
• Fermented foods:
  • Yogurt, kefir, kimchi, miso, fresh sauerkraut
“I have no energy, what do I eat?”

“What healthy foods to include for desired weight gain?”
Fatigue

- May be caused by anemia, weight loss, pain, medications, treatment, poor sleep, dehydration, weight loss, and/or insufficient calorie/protein intake.
- Ultimately, the most effective intervention requires evaluation of the above.
Nutrition Management of Fatigue

- Conserve energy by delegating responsibilities:
  - Grocery shopping, meal prep, and when eating,
  - Allow someone to shop, prep, serve meals.
- Eat most nourishing meals when appetite is best.
- Light activity and ADLs:
  - House chores, stretching, movement “snacks” all help to reduce fatigue.
Nutrition Management of Fatigue

• Meals that are quick, easy, and nutritious.
• Rethink snack choices.
• Healthy weight gain foods:
  • Avocado, nut butters, olive oil, fatty fish
• Try an “energy bite” recipe.
• Include more fiber, shown to reduce fatigue:
  • Bulgur salad recipe, snack on nuts/seeds, fresh fruit for dessert, raw veggies for a snack.
“What are the best foods to lessen neuropathy?”
Nutrition & Neuropathy

• No known intervention for the role of nutrition in neuropathy.
• **ASCO treatment and prevention guidelines**: insufficient evidence exists to support nonpharmaceutical interventions. Additional research is warranted.
• Complementary modalities:
  • Acupuncture, manual lymph drainage, physical therapy, exercise
“What is the best food for maintaining bowel movement while on Revlimid?”
Nutrition Management of Bowel Regularities

• Consistency is key to train the gut:
  • Fluid intake, activity, increase fiber at meals and snacks.
• Warm liquids promote peristalsis:
  • Tea, coffee, broth, warm prune juice, hot cereal
• Slowly increase fiber to goal of 25-35 grams per day:
  • Wheat bran, beans, bulgur, raspberries, nuts
  • Constipation paste recipe in handout.
“How do I deal with IBS?”
The Dietitian’s understanding of IBS:
- Common problem affecting the large intestine.
- Cramping, bloating, and change in bowel habits.
- Constipation, diarrhea, or a combination of the two.
- Diet is just one factor. Stress and hormones are involved.
Nutrition Management of IBS

• Try a food and symptom journal to identify patterns and potential triggers.
  • [Food & Symptom Journal](#)
• Low FODMAP diet:
  • *Short term* elimination diet to detect trigger foods.
  • FODMAPs: Group of sugars that are not completely digested are tested in phases to learn how much and what can be consumed.
  • [Monash University & Low FODMAP Diet](#)
Low FODMAP Concerns

- May exacerbate disordered eating due to restrictions during elimination phases.
- Should only be done with professional guidance.
- Harmful for someone who is malnourished:
  - Inadequate amounts of calcium, fiber, etc.
  - Socially isolating.
- May create gut “dysbiosis”.
Complementary Approaches for IBS

- **Probiotics**: *bifidobacterium* and *lactobacillus*
  - May improve symptoms, but not enough evidence
- **Peppermint oil**:
  - Mixed results, may improve symptoms.
  - *Non-enteric coated forms may cause or worsen heartburn*
- **Hypnosis & Acupuncture**
“What do you recommend for chronic diarrhea?”
Nutrition Management of Diarrhea

- Gastroenterology evaluation.
- Hydration. See handout for recipes.
- Consider a food symptom diary to identify patterns and trigger foods.
- Reduce high fiber foods, high fat foods, & lactose in foods.
Nutrition Management of Diarrhea

- Small frequent meals with soft fibers:
  - Banana, rice, applesauce, toast
  - Nana flakes. **Banatrol Plus**
- Evaluate levels of potassium, magnesium, zinc.
- Potatoes, bananas, oatmeal, yogurt, peanut butter, dry fortified breakfast cereals.
“Can you speak to your thoughts on fasting overall?”
Fasting

Many different forms of fasting:

- **Alternate day fasting**: alternating days of little to no intake with days of eating as much as desired.
- **Modified fasting**: fasting days include 20-25% of calorie needs, non fasting days are eating as much as desired.
- **5:2 diet**: a popular example: 5 days of eating as much as desired with 2 days of eating only 20-25% of calories.
Many different forms of fasting:
- **Time restricted fasting**: consuming as much as desired within a specific time frame.
- Fasting can range from 12-20 hours.
- Eating only within 4 hour up to 12 hour window.
- Religious fasting.
Fasting in Cancer Care

• May enhance anti-cancer immunosurveillance.
• Enhances T cells ability to destroy cancer cells.
• May reduce systemic levels of IGF-1:
  • Potential cancer protective effects.
• May improve response to treatment.
• May reduce side effects of treatment.
Fasting in Cancer Care

- Not without risk:
  - Hunger, dizziness.
  - May precipitate malnutrition or loss of muscle mass.
  - If not carefully planned, the “diet” may be deficient in protein, essential fats, vitamins & minerals.
Fasting in Cancer Care: Bottom Line

- Appears to be safe, especially for the time restricted fasting regimens.
- Questions remain:
  - Which cancers, stages, and what type of fasting regimens may prove effective?
  - The long-term impact: does it improve overall survival, progression free survival?
“Are there pros/cons to a Plant Based Diet?”
A Plant Based Diet

- Currently there is no consensus for how to define a Plant Based Diet.
- “Diet” that contains minimally processed plant foods.
- Most meals/snacks are centered around plant foods:
  - Fruit, vegetables, whole grains, beans/lentils, nuts/seeds. The Nourishing Plate is an example.
- PBDs are associated with reduced mortality.
Plant Based Diet Examples
What a Plant Based Diet is Not

- Ultra processed foods
- Refined carbohydrates
- Foods with high amounts of added sugars
Disadvantages Plant Based Diet

- If too restrictive, can lead to inadequate consumption of vitamins and minerals.
- Vitamin B12
  - Found primarily in animal foods
  - Plant based choices are fortified
  - Nutritional yeast:
Recipe Demonstration:
Mix & Match Stuffed Squash
Resources

- American Institute for Cancer Research
  - https://www.aicr.org
- Oncology Nutrition Practice Group
  - https://www.oncologynutrition.org/home
- Academy of Nutrition and Dietetics
  - https://www.eatright.org/
- Office of Dietary Supplements – N.I.H.
  - https://ods.od.nih.gov/