You are What You Eat:
How Food Choices Affect Recovery

Celebrating a Second Chance at Life Survivorship Symposium

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You Are What You Eat: How Food Choices Affect Recovery

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Learning Objectives:

1. Nutritional needs of Hematopoietic Stem Cell Transplant (HCT) and (Chimeric Antigen Receptor) CAR T-cell recipients in the short and long term

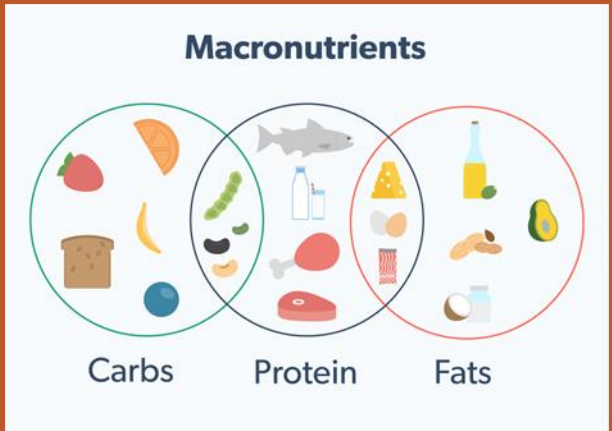
2. How to manage eating difficulties due to chemotherapy, radiation, GVHD and/or other medications

3. How food choices impact organ function and help prevent complications after HCT or CAR T

4. Common myths associated with nutrition and cancer

5. The role of prebiotics and probiotics in nutrition

Importance of food choices post HCT/CAR T



Nutrition is important for repair and recovery post-transplant!

- **Protein -** Necessary for tissue formation, cell repair, and hormone and enzyme production. It is essential for building strong muscles and a healthy immune system
- **Carbohydrates -** Provide a ready source of energy for the body and provide structural constituents for the formation of cells
- **Fat -** Provides stored energy for the body, functions as structural components of cells, and signaling molecules for proper cellular communication. It provides insulation to vital organs and works to maintain body temperature.

Importance of food choices post HCT/CAR T

Nutrition is important for repair and recovery post-transplant!

- **Vitamins** - Regulate body processes and promote normal body-system functions
- **Minerals** - Regulate body processes, are necessary for proper cellular function, and comprise body tissue
- **Water** - Transports essential nutrients to all body parts, transports waste products for disposal, and aids with body temperature maintenance

Short-Term Nutritional Needs of HCT Recipients

- **Short Term** –
  - Calorie and protein needs are much higher during treatment/transplant, we call this being in a hypermetabolic state.
  - These energy needs can be higher up to 90 days after a transplant using donor cells (allogeneic transplant).

Short-Term Nutrition Goals 1-3 Months after Transplant

- Small/Frequent meals to meet calorie and protein goals and to maintain gut integrity
- Maintain lean body mass by participating in physical activity and aiming to meet estimated calorie AND protein goals
- Estimated calorie needs during HCT:
  - 25-30 calories/kg of body weight.
  - 30-35 calories/kg of body weight if person is malnourished
- 1.3-2.0 grams of protein per kg of body weight
- Manage GI side effects w/medications and food choices when able

Short-Term Nutritional Needs of CAR T Recipients

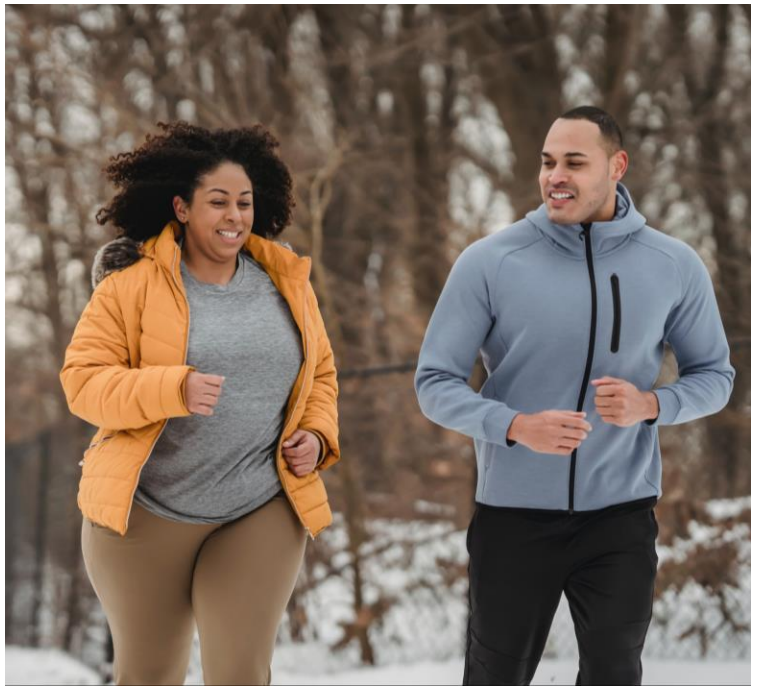
- Most common side effects of CAR T-cell therapy that can impact nutrition are:
  - cytokine release syndrome (CRS)
  - neurotoxicity (ICANS)
  - most side effects resolve within first 30 days.
- The release of pro-inflammatory cytokines, similar to that experienced in CRS, are known to:
  - reduce appetite
  - increase the body's demand for nutrition
  - accelerate catabolism

Short-Term Nutritional Goals for CAR T Recipients

- Small frequent meals, making sure mentation is appropriate and swallowing safely
- Maintain lean body mass – consuming adequate calories and protein
  - Estimated energy needs are 25-30 calories per kg
  - Estimated protein needs are 1.3-1.5 grams per kg
- Continue physical activity to preserve lean body mass

Long-Term Nutrition Goals

- Maintain a healthy body weight
- Participate in physical activity for at least 30 minutes per day e.g. household chores, walking, biking, resistance bands
- Limit alcohol consumption – 2 drinks per day for men and 1 for women
- Avoid sugary sweetened beverages
- Limit consumption of salt-preserved or highly processed foods



Aim to Meet Nutritional Needs through Diet Alone

- Eat a variety of fruits and vegetables
  - 2-3 servings of fruit and 3-5 serving of vegetables per day
  - phytonutrients are VERY important part of your diet
  - try and eat/cook with a wide variety of vegetables
- Meet your protein goals with lean meat (poultry, fish, beans, legumes, tofu, tempeh)
- Limit consumption of red meat (such as beef, pork and lamb) and avoid processed meat.

Managing Gastrointestinal Side Effects of Medication and Treatment

Causes of gastrointestinal (GI) problems:

- chemotherapy/radiation
- diet
- emotional stress
- inflammation of the intestinal mucosa
- certain medications
- lactose intolerance (which may develop as consequence of treatment), infections, malabsorption

Nutrition Interventions for Poor Appetite or Feeling Full Early

- Eat by the clock rather than waiting to feel hungry
- Drink high calorie/protein fluids, like protein supplements
- Drink majority of fluids between meals, rather than with them
- Maximize intake when most hungry
- Eat in pleasant surroundings, avoiding stress & conflicts
- Get treatment for contributing conditions like constipation or depression
- Are medications depressing appetite? Talk to doctor about appetite stimulants

Nutrition Interventions for Changes in Taste and Smell

- No taste:
  - try marinating meats, lemon, herbs & spices, pickles, hot sauce
- “Off taste”:
  - try fruity, sweet, and salty flavors
- Metallic taste:
  - try spices like garlic, onion, chili
  - use plastic utensils
- Too salty:
  - Choose foods that are naturally sweet;
  - Low-sodium
- Use more heavily spiced foods if tolerated

Nutrition Interventions for Changes in Taste and Smell cont'd

- Address dry mouth & oral hygiene
- Chew sugar-free gum or suck on lemon drops/mints throughout the day
- Avoid strong smells:
  - avoid cooking areas
  - choose cold foods
  - use cup with lid
- Zinc supplement (no more than 60 days due to risk of copper deficiency)

Nutrition Interventions for Dry Mouth

- Soft foods with sauces/gravies or dip dry foods in liquid
- Alternate bites/sips at meals
- Suck on hard candies, frozen grapes, or melon balls
- Thin oral secretions with carbonated beverages or papaya nectar
- Use Biotene/Lubricity as artificial saliva

Nutrition Interventions for Mouth Sores/ Mucositis

- Choose foods that are soft and easy to swallow
- Avoid dry, chewy or crunchy foods
- Dunk or soak foods in liquid to make them softer
- Avoid acidic and citrus flavored foods and juices
- Utilize bicarb mouth wash (easy to make at home w/ 1 teaspoon of baking soda, 1 teaspoon of salt and 1 quart of water)
- Utilize lidocaine or Dexamethasone swish and spit for oral pain relief

Nutrition Interventions for Nausea, Vomiting, Reflux and Burping

- Ask your health care team about antiemetics
- Take antiemetics on time
- Time meals when antiemetics are most effective
- Smaller and more frequent meals
- Avoid high fat or greasy foods
- Avoid medications on empty stomach (unless required)
- Ginger containing foods
- Acupressure bracelets, acupuncture, massage, distraction techniques

Nutrition Interventions for Diarrhea

- Discuss food history/eating habits and symptom history with dietitian
- Try low fat, low fiber, low lactose diet
- Avoid gas-producing foods or caffeine
- Consider using of bulking agents, pectin, or soluble fiber foods
- Avoid sorbitol or other sugar-alcohol containing products
- Drink plenty of fluids
- Consider additional electrolytes or multivitamin

Graft-versus-Host Disease (GVHD) – GI Tract

- GI GVHD a potential problem only after a transplant using donor cells (allogeneic transplant)
- Symptoms can be mild, moderate or severe including:
  - Nausea
  - Vomiting
  - Diarrhea
  - Blood in stool
  - Abdominal cramping
  - Poor appetite
  - Severe weight loss

GI GVHD - Treatment

- Standard treatment – high-dose corticosteroids
- Diet modifications vary depending on severity.
- Avoid:
  - high fat foods
  - high fiber foods
  - acidic foods
  - caffeine
  - dairy
- Focus on easy to digest carbohydrates and lean protein

Easy to digest carbohydrates:
Fruit (without the skin)
White rice
White bread
Pasta
Low fiber cereal
Potato
Sweet potato

Lean Protein:
Eggs
Egg whites
Chicken
Turkey
Tofu
Fish (usually white fish) –
Tilapia, Cod, Flounder

Calorie and Protein Needs with GVHD

- Patients typically need:
  - 30-40 kcal/kg
  - 1.5-2.0 g/protein/kg

- In cases of malnutrition/severe complications:
  - 30-40 kcals/kg
  - 1.8-2.5 g/protein/kg

To calculate kg of body weight divide your weight in pounds by 2.2 – that will be your weight in kg for these calculations

Nutrition and Steroids

- Muscle wasting is a common side effect of high dose corticosteroids commonly used to treat GVHD.
- Typically begins a few weeks to few months after starting steroids
- Can cause weakness/atrophy in arms, legs, hands and feet
- Prevention/Treatment includes:
  - Tapering steroid dose if able
  - **Meeting calorie and protein goals!** (getting enough calories and protein – but also not forgetting about all the important vitamins, minerals healthy fats etc.)
- Physical activity/Resistance training

Debunking Common Cancer Myths

"Sugar Feeds Cancer"

- A direct link between sugar intake and cancer diagnosis has not been found, HOWEVER excess sugar intake can lead to obesity and chronic inflammation, which CAN increase risk of cancer
- Glucose (sugar) feeds ALL of our cells – healthy cells and cancer cells
- This misconception may be based in part on a misunderstanding of positron emission tomography (PET) scans, which use a small amount of radioactive tracer — typically a form of glucose to identify and assess the increased metabolic activity of cancer cells
- This does NOT mean eat a diet full of excess sugar – especially refined sugar
- The recommendation is <25g of ADDED sugar per day or around 10% of your daily calorie intake

Debunking Common Cancer Myths

"Weight Loss is desired during cancer treatment"

- Weight loss DURING treatment primarily comes from muscle loss

- A loss of as little as 6% of body weight can predict reductions in treatment response, survival, and quality of life

- Weight loss post treatment CAN be done in a healthy way that preserves lean body mass – but you have to make sure you are eating enough dietary protein!

Debunking Common Cancer Myths

"Juice cleanses and detoxes are beneficial during treatment"

- Juicing is a way to make a beverage by turning fruits and vegetables in liquid or "juice" form
- There are claims that high quantities of vitamins and minerals in these juices can be beneficial during cancer treatment
- Juicing ALONE lacks sufficient calories and protein to keep your body nourished during treatment BUT can be used in conjunction with a general healthful diet and provide additional vitamins, minerals and antioxidants to your body
- Juicing takes the FIBER out of food – which fiber is good for our gut health and it is recommended that we eat at least 25-30 grams of fiber per day
- There is a high cost associated with juicing

Debunking Common Cancer Myths

"There are "super foods" that alone can fight cancer"

- Media coverage of these so-called "miracle foods" is often just a marketing tool
- Isolating one nutrient is over-simplifying the role that nutrition plays in our health
- Eating a WELL-BALANCED and DIVERSE diet FULL of vegetables, fruits, whole grains, lean protein and healthy fats continues to be the best cancer prevention diet
- Food Industry "Superfood Claim":
  - Quinoa and ancient grains
  - Acai
  - Avocado
  - Broccoli
  - Cacao
  - Chia seeds
  - Garlic
  - Gogi
  - Green tea
  - Kefir
  - Pomegranate
  - Salmon
  - Seaweed
  - Wheatgrass

Debunking Common Cancer Myths

"High doses of vitamins and minerals beneficial during cancer treatment"

- Vitamin and mineral supplements CAN be beneficial, BUT a food first approach is best
- Supplements are unregulated
- Supplements can interfere with some medications
- High doses can actually put extra strain on your liver and kidneys
- Eating a balanced diet with adequate fruits and vegetables (5-6 servings of fruits and vegetables per day is recommended)

Probiotics

- Probiotics are the good bacteria needed in the digestive tract
- Must be eaten regularly
- Best sources:
  - Fermented Vegetables (sauerkraut, kimchi, pickles, beets, carrots)
  - Fermented fruits (chutneys, jams, green papaya, pickled jack fruit)
  - yogurt, kefir, sour cream, buttermilk (with live and active cultures)
  - Kombucha
  - Miso, Tempeh

Prebiotics

- Fiber rich foods that help probiotics flourish
- When probiotics “eat” or break down prebiotics in the colon, they produce butyric acid that fuels digestive cells, protects the digestive tract against harmful bacteria.
- Best Food Sources of Prebiotics:
  - Asparagus
  - Avocado
  - Banana
  - Dandelion greens
  - Eggplant
  - Garlic, Leeks, Onions
  - Honey
  - Jimaca
  - Kefir, Yogurt
  - Legumes
  - Whole Grains

Probiotic Supplements versus Food

- CFU (colony forming units)
- Supplements typically contain **1-10 billion** per dose
- CFU's in food:
  - **Kefir**: **27.7 billion** CFU (Colony Forming Units) per 1 cup serving
  - **Kimchi**: **2.6 billion** CFU per 1/2 cup serving
  - **Yogurt**: **3.6 billion** CFU per 1 cup serving
  - **Miso**: **54.1 thousand** CFU per 1 tbsp serving
  - **Sauerkraut**: **195.2 million** CFU per 1/2 cup serving
  - **Kombucha**: **23.1 million** CFU per 1 cup serving

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Questions?

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