

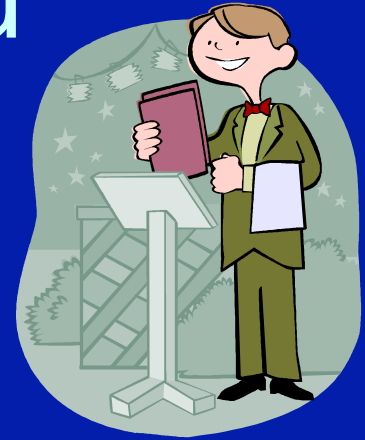


*Nutrition Essentials for  
Neuroendocrine Tumor Patients:*  
**WHAT TO EAT & WHY**

Presented by:  
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# On Today's Menu

- Healthy Eating Basics
- Nutrition and Cancer Treatment
- Carcinoid Syndrome & Diet
- Resources for More Information



# Healthy Eating AICR Guidelines for C



[www.aicr.org](http://www.aicr.org)

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## Recommendations for cancer prevention

1. Be as lean as possible without becoming underweight.
2. Be physically active for at least 30 minutes every day.
3. Avoid sugary drinks. Limit consumption of energy-dense foods (particularly processed foods high in added sugar, or low in fiber, or high in fat).
4. Eat more of a variety of vegetables, fruits, whole grains and legumes such as beans.
5. Limit consumption of red meats (such as beef, pork and lamb) and avoid processed meats.
6. If consumed at all, limit alcoholic drinks to 2 for men and 1 for women a day.
7. Limit consumption of salty foods and foods processed with salt (sodium).
8. Don't use supplements to protect against cancer.
9. It's best for mothers to breastfeed exclusively for up to six months and then add other liquids and foods.
10. After treatment, cancer survivors should follow the recommendations for cancer prevention.

*And, always remember -  
do not smoke or chew tobacco.*

# Diet and Cancer Survival



**“Guidelines Say Diet, Exercise, Weight Control Improve Odds after Cancer Diagnosis”.**

- American Cancer Society, 2012 Press Release

## Sampling of study findings:

Cancer Type	Greater Survival Associated With...	Reference
<b>Breast</b>	<p>≥5 servings veggies/fruit per day + 30 min exercise, 6 x/wk (45% more likely to survive 10 yrs)</p> <p>BMI ≤30 kg/m<sup>2</sup> (46% lower risk of distant metastases after 10 years)</p>	<p>Pierce JP, et al. J Clin Oncol. 2007 Jun 10;25(17):2345-51</p> <p>Ewertz, M, et al. J Clin Oncol. 2011 Jan 1;29(1):25-31</p>
<b>Colon</b>	Non-Western dietary pattern (230% more likely to survive 5 yrs)	Meyerhardt J, et al. JAMA. 2007 Aug 15;298(7):754-64
<b>Ovarian</b>	≥5 servings veggies/fruit per day (39% more likely to survive 10 yrs)	Dolecek TA, et al. J Am Diet Assoc. 2010 Mar;110(3):369-82



**Your plate should hold  $\frac{2}{3}$  (or more) vegetables, fruit, whole grains and beans and  $\frac{1}{3}$  (or less) meat, chicken or fish.**

# Include daily physical activity

In cancer survivors, exercise:

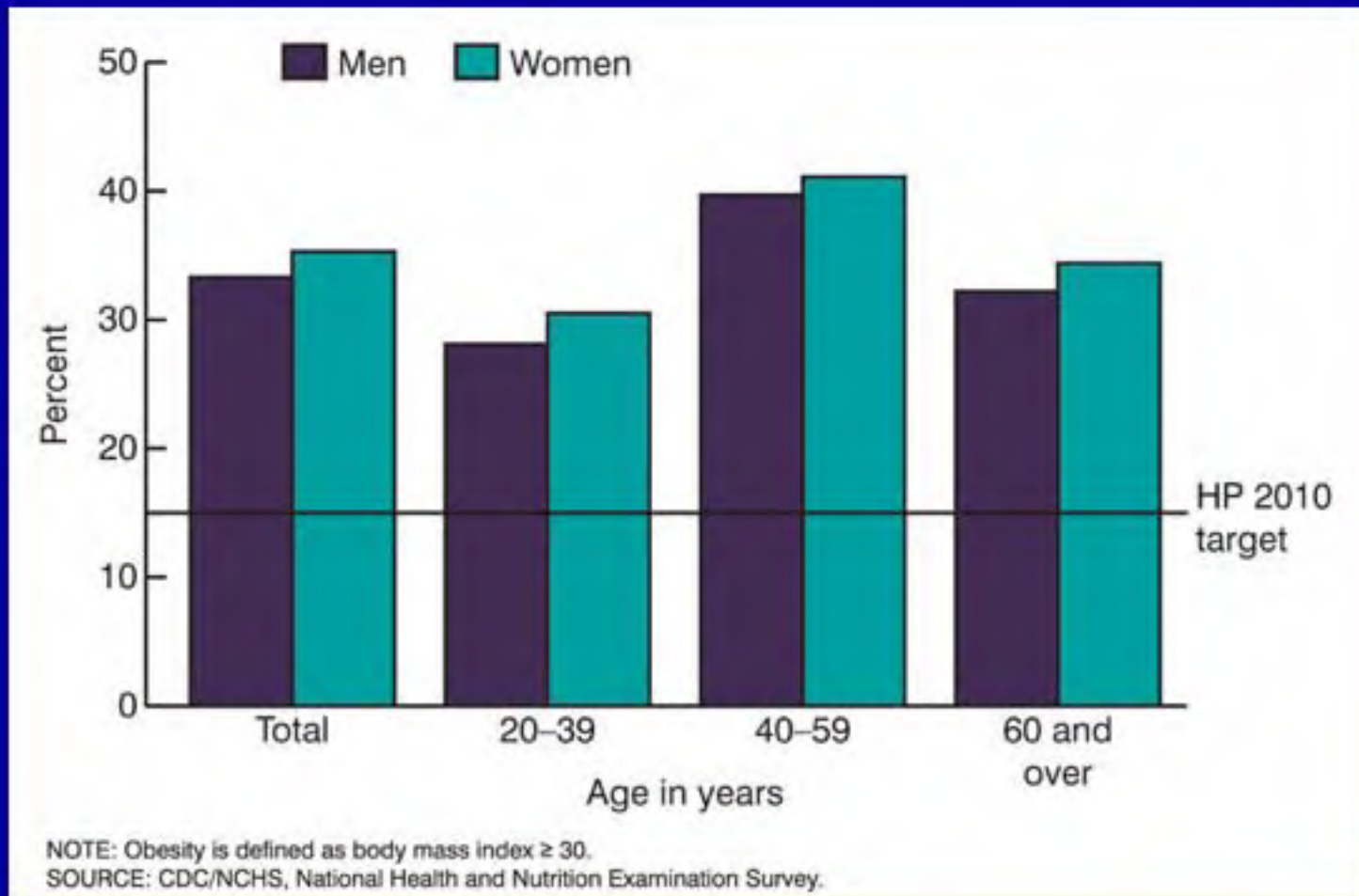
- Improves cardiovascular fitness, muscle strength & body composition
- Decreases fatigue, anxiety & depression
- Improves self-esteem and happiness
- Aids in weight management & maintaining muscle mass
- Lowers recurrence and improves mortality

Any activity as long as it is done consistently beneficial (even 5 minutes!).

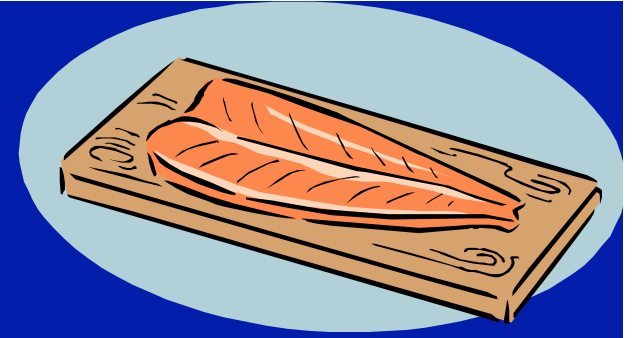


# Aim for a healthy weight

## Percentage of obese American adults



# Omega-3 Fatty Acids



- Benefits include:
  - Decreasing cancer-related weight loss and fatigue
  - Supporting the immune system
  - Benefits for heart health and mood
- Food sources:
  - Wild salmon, trout, herring, sablefish, sardines
  - Flaxseed meal, walnuts, pumpkin seeds, chia seeds.
- Aim for a plant source daily and 2 servings of fish (~4 oz) weekly.
  - May want to consider taking a good quality supplement if dietary intake is low.



# Vitamin D



- Important for:
  - Immune function
  - Normal cell cycle process
  - Reducing inflammation
  - Muscle strength and bone health
- Sources:
  - Sunlight, fatty fish, eggs, fortified foods & dietary supplements
- Adults need  $\geq 600$  IU Vitamin D3/day.
- Check vitamin D blood levels (25-OH, vitamin D) to ensure adequate stores → especially with chronic diarrhea or malabsorption.

# Summary: Healthy Diet Guidelines

- Balanced diet with a variety of foods:
  - Primarily plant based diet
  - Choose fruits & vegetables of intense color
  - Choose whole grains over refined choices
  - Choose lean & plant protein sources
  - Limit added sugars & fats
  - Adequate fluids – limit sugary drinks & alcohol
- Be physically active
- Maintain a healthy weight
- Modify diet as needed to manage side effects of treatment

# Nutrition During Cancer Treatment

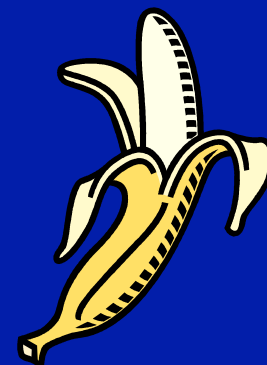
- Nutrition related side effects of treatment:
  - Nutrition deficiencies
  - Diarrhea
  - Weight loss, etc...
- Carcinoid syndrome
- Specific types of tumors or syndromes:
  - Insulinomas, Gastrinomas, VIPomas, etc...
- Other medical issues:
  - Diabetes, etc...

# Potential Nutrition Related Side Effects of Cancer and Cancer Treatment

- Nausea/Vomiting/Constipation/Diarrhea
- Poor Appetite
- Weight Loss
- Weight Gain
- Taste Changes/Dry Mouth
- Chewing or Swallowing Difficulties
- Fatigue!



# Nutrition Management of Diarrhea



- **Variety of causes with NETs**
- Replace fluid and electrolytes
  - Sip fluids: 8 to 10 cups of clear liquids a day
  - Potassium: banana, potatoes, avocado, melon, coconut water
  - Sodium: Propel<sup>®</sup> (sports drinks), broth, saltines, pretzels
- Decrease demands on the GI tract
  - Eat small, frequent meals and snacks
  - Chew your food well
  - Limit GI irritants: magnesium, caffeine, extreme hot/cold
  - Avoid fatty and greasy foods.
  - Limit concentrated sweets, sugar alcohols

# Nutrition Management of Diarrhea (Cont)

- Limit lactose
  - Yogurt, lactose free milk may be tolerated
  - Add Dairy Digestive/Lactaid<sup>®</sup> or non-dairy alternatives
- Avoid gas-forming foods & high *insoluble fiber*
  - Gas forming foods include onions, cabbage, broccoli, cauliflower, soft drinks, beans and chewing gum.
  - Insoluble fiber adds bulk to the stool causing food to pass more quickly through the stomach and intestines  
→ increasing loose stools:
    - Examples of high fiber foods: raw, unpeeled fruits, dried fruits, raw vegetables, whole grain breads and cereals, nuts and seeds

# Nutrition Management of Diarrhea (Cont)

- Choose low fiber/low residue foods
  - Examples: white rice (congee), peeled potatoes, cream of wheat, select cooked vegetables and fruits, bananas
- Increase *soluble* fiber
  - Attracts water and turns to gel slowing down digestion  
→ decreasing loose stools:
    - Examples: oat bran, barley, bananas, applesauce, cooked carrots, Benefiber® (fiber supplement)
- **Talk with your doctor and a registered dietitian for other hints, medications or modifications to help control symptoms.**

# Carcinoid Syndrome & Diet

- Symptoms include flushing, sweating wheezing, diarrhea, abdominal pain...
- Common triggers:
  - Hormone secretions
  - Certain foods
- ***If you have symptoms – diet changes may help.***



# Carcinoid Syndrome & Diet (cont)

- You are unique!
  - Diet & strategies need to be individualized.
  - Track your symptoms so you know what works & what doesn't.
- Most common reported food triggers:
  - Large meals
  - Fatty meals
  - Alcohol
  - Very spicy foods
  - Foods that contain high amounts of amines



# Carcinoid Syndrome & Diet (cont)

- **If no symptoms** → Eat a balanced, plant based diet.
- **With symptoms:**
  - Follow earlier suggestions for diarrhea management.
  - Increase protein intake to provide additional tryptophan: 1.2-1.5 g/kg
    - Ex: 150 lb = 68 kg = 102 g protein/day
    - Fish, poultry, lean meats, beans, eggs/whites, low fat dairy, whey protein powder, etc...
  - Add 25-50 mg niacin or nicotinamide (vitamin B3) twice a day to avoid deficiency.
  - Consume foods low in amines.

# Amine Content of Foods

Vasoactive or pressor amines (precursors for adrenaline)

## FOODS WITH THE HIGHEST AMOUNTS:

(Most likely triggers of carcinoid symptoms):

- Aged cheeses
- Alcohol
- Smoked, salted fish and meats
- Yeast extracts (in many processed foods), Brewer's yeast
- Fermented foods (tofu, miso, sauerkraut)

## FOODS WITH MODERATE AMOUNTS:

(May triggers carcinoid symptoms):

- Caffeine (large amounts), coffee, colas
- Chocolate (especially dark)
- Peanuts, brazil nuts, coconut
- Avocado, banana, raspberries
- Most soybean products (soy sauce, tempeh)
- Fava beans (aka broad beans)

# Amine Content of Foods

Vasoactive or pressor amines (precursors for adrenaline)

## **Foods low in amines (unlikely to trigger carcinoid symptoms ):**

- Fresh lean meats, poultry & fish
- Fresh lunch meats – fresh roasted turkey
- Most vegetables & fruits
- Fresh boiled soybeans (edamame), soy milk
- Ricotta cheese, mozzarella cheese, cottage cheese, yogurt & cream cheese

# Summary

- Good nutrition is essential to health.
- Nutrition is a vital component of treatment tolerance, side effect management and quality of life for NET patients.
- Ask to be referred to a Registered Dietitians (RD) that specialize in Oncology Nutrition (CSO) to help you optimize your nutritional status.

# Resources

## Recommended Websites

<http://www.caringforcarcinoid.org>

<http://www.oncologynutrition.org>

<http://www.cancerrd.com>

<http://www.consumerlab.com>

<http://www.carcinoid.org>

<http://www.aicr.org>

<http://cc.ucsf.edu/crc>

## Recommended Books/Cookbooks

- One Bite at a Time, 2<sup>nd</sup> Edition, The Cancer Fighting Kitchen, The Longevity Kitchen - R Katz, 2008, 2009, 2013
- The New American Plate Cookbook –AICR, 2006
- The Essential Cancer Treatment Nutrition Guide and Cookbook – J LaMantia, 2012



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