Nutrition and Pancreatic Enzymes for Side Effect Management
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Jeannine Mills, MS, RD, CSO, LD

Nutrition Therapy Goals

• Prevent or reverse poor nutrition
• Maintain dose and schedule of cancer treatments
• Manage symptoms
• Maintain or improve weight and strength
• Maximize quality of life
Role of the Pancreas

- Produce enzymes to help digest food to be transported in blood stream
- Produce insulin to help transfer glucose from the blood to the cells where it is used for energy.
Pancreatic Enzymes

Enzymes + Protein + Carbohydrate = Fatty Acids + Amino Acids

Insulin

Glucose + Insulin → Receptor → Glucose

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Common Side Effects

• Diarrhea
• Pancreatic exocrine insufficiency
• Glucose intolerance, diabetes
• Nausea and/or vomiting
• Loss of appetite, weight loss

Common Side Effects (continued)

• Taste changes
• Early satiety
• Constipation
Pancreatic Enzymes

Symptoms of Pancreatic Exocrine Insufficiency

- Feelings of indigestion
- Cramping after meals
- Large amounts of gas
- Foul smelling gas or stools
- Floating stools or greasy/fatty stools
- Frequent stools
- Loose stools/diarrhea
- Unexplained weight loss
Narcotic = Constipation

+ 

Malabsorption = Diarrhea 

Normal Bowel Function

How to Optimize Enzymes:

• Take at the beginning and throughout the meal/snack
• Don’t take at the same time as antacids or iron supplements
• If prescribed by your doctor, take acid reducing medication daily.
The Right Enzyme and how much to take

• Find the brand and the dose that works for you and stick with it.
• Start:
  – Meals: 20,000-40,000 units of lipase per meal
  – Snacks: 10,000-20,000 units of lipase per snack

Enzyme Dosage: Titration

• Increase until pancreatic insufficiency symptoms are minimized/eliminated

• Maximum: 2500 units of lipase per kilogram per meal (or 10000 units of lipase per kilogram per day)
What does that really mean?

- 60 kg (130 lb) woman
- Max daily dose = weight x 10,000 L.U.

\[ 60 \times 10000 = 600,000 \text{ lipase units/day} = 48 \text{ capsules Creon 12,000} \]

Or \(60 \text{ capsules Zenpep 10,000}\)

Pancreatic Enzymes:
Side effects of too many

- Constipation (most common)
- Nausea
- Abdominal Cramps
- Diarrhea

(Careful not to confuse with symptoms of inadequate enzyme use or chemotherapy or radiation treatment.)
Symptom Management

Common Side Effects

• Diarrhea
• Constipation
• Nausea and/or vomiting
• Early satiety
• Excessive gas
• Taste Changes
• Poor appetite
Diarrhea

• Work closely with medical team (multiple causes of diarrhea):
  – Treatment Induced
  – Lactose Intolerance
  – Bacterial Overgrowth
  – Pancreatic/Digestive Insufficiency
  – Dumping syndrome (after Whipple or gastric bypass)

Nutrition Therapy for Diarrhea
Independent of cause

Limit or avoid:
• Lactose (or add lactase)
• Insoluble fiber
• Foods sweetened with sugar alcohol
• Sugar sweetened beverages
Nutrition Therapy for Diarrhea
Independent of cause

Increase:
• Soluble fiber
• Fluids

Probiotics for Diarrhea

• Sources of probiotics:
  – Foods
  – Dietary Supplements
**Constipation**

- Hot fluids
- Include high fiber foods
- Limit gas forming foods, carbonated beverages, straws, chewing gum
- Bowel regimen may be warranted

**Nausea/Vomiting**

- Eliminate offending odors
- Dry crackers/toast
- Avoid overly sweet, greasy/fried, or highly spiced foods
- Use room temp foods
- Oral care
- Eliminate stress
- Medication
Early Satiety

- Alleviate gas and bloating
- Liquids between meals
- Small servings, more often
- Limit high fat or fried foods
- High fiber foods may be problematic
- Medications

Excessive gas

- Optimize pancreatic enzymes
- Use simethicone (Gas-X) liberally
- Consider Bean-O
- Avoid gas-producing foods:
  - Broccoli, cauliflower, cabbage
  - Onions
  - Beans
  - Carbonated beverages (beer, soda)
- Avoid chewing gum
- Avoid drinking through straws
Taste Changes

- Rinse mouth
- Metallic taste: use plastic utensils and serving ware
- Enhance dull taste use tart flavors
- Try new foods or foods previously disliked

Poor Appetite

- Eat small amounts frequently
- Schedule meals/snacks
- Use liquid supplements/smoothies
- Light exercise
- Alcoholic beverage before meal
- May benefit from medication
### Liquid Nutritional Drinks

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- Home made smoothies
  - Mix in blender
  - Liquid: juice, yogurt, milk, soymilk, etc
  - Fruit and/or cooked vegetables
  - Protein: protein powder, tofu, cottage cheese

### What to Eat?
General Nutrition Tips

• Eat small frequent meals (6-8/day)
• Plan meals/snacks the day before
• Get plenty of fluids
• Limit use/portions of fat containing foods
• Choose nutrient dense foods
• Be active

Protein

• Poultry, fish, meat
• Beans, peas, lentils
• Nuts and seeds
• Eggs
• Yogurt, milk, cheese
• Vegetarian alternatives: soy milk, tofu, veggie burgers, protein powders, etc.
Complex Carbohydrate

- Bread, pasta, rice, cereal, etc
- Fruits
- Vegetables
- Dairy products

Fat \text{ (as tolerated)}

- Nuts and seeds
- Avocado
- Olives
- Oil: canola, olive, peanut

Other fats to use sparingly:
- Butter, stick margarine, hydrogenated oils
  \text{(or foods that use these as ingredients)}
**Fluids**

Most patients require 6 to 12 cups per day of non-alcoholic fluid per day to maintain adequate hydration. (8 oz. = 1 cup)

- Water
- Juice (100%)
- Milk or dairy alternatives
- Gelatin
- Tea
- Sports drinks
- Broth

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**Glucose Intolerance/Diabetes**

- Medication
- Customize diet
- Limit refined carbohydrates
- Eat carbs in combination with protein, fiber, and fats
Finding a Dietitian

• How to Find a Registered Dietitian:
  – Request a consult at your cancer center
  – Commission on Dietetic Registration
    • Search: List of Board Certified Specialists in Oncology Nutrition by State- www.cdrnet.org
  – Contact the Pancreatic Cancer Action Network
  – Contact The Academy of Nutrition and Dietetics www.eatright.org

Cookbooks

• Betty Crocker’s Living With Cancer Cookbook (2011)
• What to Eat During Cancer Treatment: 100 Great-Tasting, Family-Friendly Recipes to Help You Cope (2009) by Jeanne Besser
• The Cancer-fighting Kitchen: Nourishing, Big-Flavor Recipes for Cancer Treatment and Recovery (2009) by Rebecca Katz
• One Bite at a Time (2009) by Rebecca Katz
• Eating Well Through Cancer: Easy Recipes & Recommendations During & After Treatment (2006) by Holly Clegg
• The New American Plate Cookbook: Recipes for a Healthy Weight and a Healthy Life (2005) by The American Institute for Cancer Research