

DIET AND NUTRITION IN PANCREATIC CANCER:

THE ROLE OF PANCREATIC ENZYMES

WHY DOES MY PANCREAS MATTER?

The pancreas is a small organ located behind your stomach that plays two very different and important roles.

1. Exocrine function that helps in digestion

- The pancreas makes digestive juice that empties into the small intestine
- This pancreatic juice contains enzymes that help break down the food you eat, including:
 - lipase to break down fats
 - proteases to break down proteins and
 - amylase to break down carbohydrates
- Without these enzymes, most of the food you eat would pass through your intestines without being absorbed (known as malabsorption)
 - This includes fat, which contributes a lot of the energy of your diet
 - The inability to absorb fat contributes to the weight loss many people with pancreatic cancer experience

2. Endocrine function that controls blood sugar

- The pancreas also makes the hormones insulin and glucagon, which help control your blood sugar
- Insulin reduces the amount of sugar in your blood after a meal while glucagon raises it in between meals
- If your pancreas does not produce enough insulin, your blood sugar will be too high, resulting in diabetes

This information was developed and approved by an expert panel of healthcare professionals in the field of pancreatic cancer.

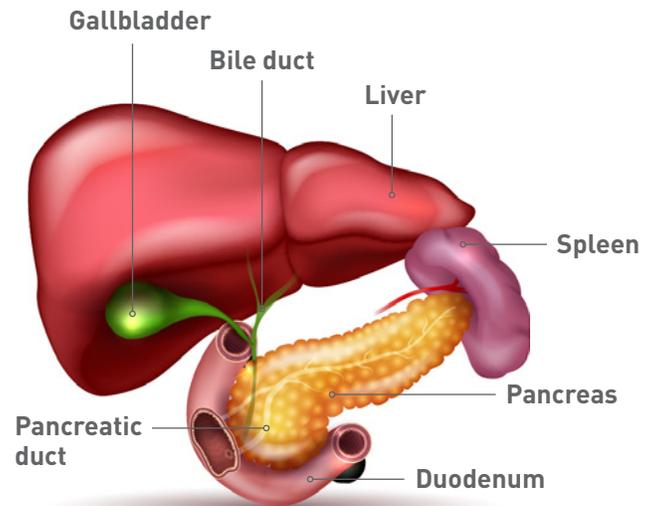
HOW DOES PANCREATIC CANCER AFFECT DIGESTION AND NUTRITION?

The vast majority of pancreatic cancers (about 95%) are exocrine tumors.

Pancreatic cancer can block the ducts that carry digestive juices from your pancreas to the small intestine.

- This blockage of the pancreatic duct will directly prevent the pancreas from delivering pancreatic digestive enzymes to the small intestine.
- The pancreas upstream from the blockage will wither away and eventually stop producing digestive enzymes. The part of the pancreas that will wither away is the digestive/exocrine part of the pancreas.
- The endocrine part of the pancreas remains, but for unknown reasons, people with exocrine pancreatic cancer often develop diabetes.

Surgical removal of part of your pancreas will also affect its ability to produce enough pancreatic enzymes to break down and absorb nutrients from your food.



WHAT ARE THE SIGNS OF POOR ABSORPTION?

Symptoms of malabsorption associated with a lack of pancreatic enzymes include:



Unplanned weight loss



Bloating or stomach pain after eating



Bad smelling gas or stools



Diarrhea (more frequent, watery stools)



Light-colored, yellowish, oily/greasy, or floating stools

DO I NEED TO TAKE PANCREATIC ENZYMES?

If the pancreas is unable to produce enough digestive juices to break down food, you may need to take pancreatic enzyme replacement therapy with your meals.

Taking these enzyme supplements will:



Help you break down and absorb nutrients from your food



Reduce your digestive problems and decrease bloating, cramping, and diarrhea



Prevent weight loss



Improve your comfort and life satisfaction, which can make a big difference in how you feel

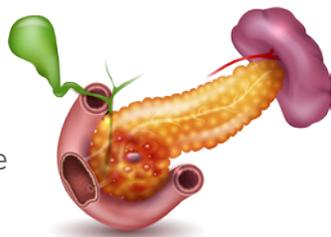
HOW DO I TAKE PANCREATIC ENZYMES?

These capsules contain a mixture of pancreatic digestive enzymes that must be taken with every meal or snack, especially those containing fat. The recommended type and dosage vary from person to person.

It is important to talk with your healthcare team (physician, nurse, pharmacist or dietitian) at regular visits about how to take your enzymes.

To start:

- Although pancreatic enzyme supplements only contain enzymes that your pancreas is no longer able to produce, many people experience some stomach upset when starting to take them.
- Due to the stomach upset, physicians will usually start you on a lower dose and increase the dose to the desired dose, as tolerated.
- The stomach discomfort usually only lasts for 10 to 14 days (then usually just goes away).



Dosage

The dose of the capsules will vary depending on the manufacturer and whether you are just starting to take pancreatic enzyme supplements. Your physician and dietitian will decide this on an individual basis.

Important factors to consider when deciding on a dose include:



The degree/severity of symptoms present (increase dose if you still have symptoms)



The size and fat content of your meals (more dietary fat requires more enzymes)

If your symptoms do not improve, schedule a follow-up visit with a member of your healthcare team (physician, nurse, dietitian).

TIPS WHEN TAKING PANCREATIC ENZYMES

- Take enzymes at the beginning of every meal and snack (not before or at the end) or with every milky drink or liquid supplement. Your first capsule should be taken with your first bite of food. If you are taking multiple enzymes, the others should be taken about midway through the meal.
- Swallow capsules whole, with water, so that the enzymes can work in your intestines. Don't crush or chew them unless directed by a member of your medical team.
- If swallowing a capsule is difficult, open them and sprinkle the contents on a spoonful of fruit puree, like applesauce. Then swallow the mixture immediately, don't chew. Do not sprinkle the contents onto dairy products as they can destroy the enzyme activity.
- Do not worry if you miss a dose. Don't double the dose at your next meal, and don't take a dose in between meals (should only be taken with food).
- Pancreatic enzymes may have reduced effectiveness if taken at the same time as antacids with calcium or magnesium.
- Store enzymes at room temperature – they can be damaged by heat. Do not leave them in your car on a hot day, in direct sunlight, near toasters, etc.
- It is important to take these enzymes as prescribed and take all doses.

GENERAL NUTRITION TIPS



If you take enough enzymes to digest the foods you eat, you won't have to cut out foods that might cause symptoms, such as fatty foods.



Eat a well-balanced diet, including foods that contain protein, complex carbohydrates, and healthy fats. Include fruits, vegetables, lean protein, and whole grains.



Eat foods high in protein, such as lean meat and poultry, fish, eggs, milk/cheese, nuts and nut butters, seeds, beans, lentils, etc.



Drink plenty of fluids to avoid dehydration, including water, juices, smoothies, and liquid nutrition supplements.



You may need to take a vitamin and mineral supplement to help make sure you are getting enough vitamins and minerals.



Talk with your oncology pharmacist or dietitian about taking any over-the-counter or natural medication/supplements.

DIABETES & CONTROLLING BLOOD SUGAR



You may also develop diabetes if you have pancreatic cancer, or may already have had diabetes before your diagnosis.



Make sure your blood sugar is under control, as too much sugar in your blood can contribute to neuropathy (numbness, tingling, or pain in hands/feet) and could influence what chemotherapy you receive.



Monitor your blood sugar levels and take diabetes medication as prescribed. Avoid excess sugars and carbohydrates, which break down to sugar in the body. These include bread, rice, pasta, potatoes, etc.



Opt for high-fibre carbohydrates or those with a lower glycemic index, which won't affect your blood sugar levels as much, including whole grain cereals/breads, vegetables, and fruit.



Be as active as possible.

REFERENCES & RESOURCES

- Pancreatic Cancer Action Network. Diet and Nutrition. www.pancan.org/facing-pancreatic-cancer/diet-and-nutrition
- Pancreatic Cancer Action. Diet and Nutrition. www.pancreaticcanceraction.org/about-pancreatic-cancer/diet-and-nutrition
- Pancreatic Cancer Canada. Know the Facts. www.pancreaticcancerCanada.ca/facing-pancreatic-cancer/know-the-facts
- Pancreatic Cancer Canada. Diet and Nutrition. http://donate.pancreaticcancerCanada.ca/site/PageServer?pagename=facingpancreaticcancer_diet
- Pancreatic Cancer Canada. The Gloria Pearl Educational Series (GPES), Cookin' in the Kitchen. http://donate.pancreaticcancerCanada.ca/site/PageNavigator/facingpancreaticcancer_GPES_Cookin_inthe_Kitchen_videos.html
- Nourish - information relating to nutrition and cancer website. www.nourishonline.ca