



Pancreatic Enzyme Replacement Therapy (PERT)

Pancreatic enzymes help digest fat, protein and carbohydrates in the food you eat. However, diseases that affect the pancreas such as cancer of the pancreas, pancreatitis, cystic fibrosis, or surgeries that involve the pancreas, may block the release or reduce the amount of digestive enzymes produced by the pancreas.

Without enough pancreatic enzymes, the foods you eat won't be fully digested and you won't absorb all the nutrients and calories available from them. This is sometimes called malabsorption, meaning you aren't absorbing all your nutrition.

Symptoms of malabsorption can include:

- Gas.
- Bloating.
- Loose stools.
- Diarrhea.
- Pain after eating.
- Weight loss due to malabsorption.

When the fat in foods is not digested it can cause fatty stools, also known as steatorrhea. Symptoms of steatorrhea include:

- Light brown stools.
- Loose, oily stools that can be difficult to flush.
- Foul smelling stools.

What is pancreatic enzyme replacement therapy and how does it work?

Pancreatic enzyme replacement therapy is the use of medications that contain enzymes to replace what the pancreas is no longer making or releasing. These medications contain proteases to digest protein, amylases to digest carbohydrates and lipases to digest fat. Digestion of protein, carbohydrates and fats helps prevent malabsorption.

The dosing for these medications is based on the units of lipase in the capsules. The amount of lipase prescribed ranges from 2,600 to 40,000 lipase units per capsule. Children and people eating small amounts of food need lower doses, while adults are usually prescribed doses greater than 20,000 lipase units per capsule.

Your medical team will instruct you on the number of capsules you will need. The general recommendation for adults is 2-3 capsules with standard sized meals and 1-2 capsules with snacks and small meals. The numbers of capsules needed may vary from person to person. Because of this you may be instructed to change the number of capsules you take depending on the symptoms you are having.

Remember the purpose of these medications is to help you digest and absorb the nutrients in your foods and to reduce the problems associated with malabsorption. Pancreatic enzymes are unlike other medications because the dose has to be adjusted to your level of enzyme insufficiency. Dosing is personalized and will be determined by you and your team.

How to take Pancreatic Enzyme Replacement Medications

You should swallow the capsules with cold or room temperature liquids. Enzymes are deactivated at high temperatures so do not swallow with hot beverages. Do not chew or crush the capsules as they can hurt your mouth. The capsules can be large and sometimes be difficult to swallow. If you are having trouble swallowing the capsules you can:

- Ask for lower dosed capsules which are smaller. However, you will need to take more capsules to get the same dose of enzymes.
- Open the capsules and mix the enzymes with a little applesauce or other acidic foods (yogurt, mashed banana or baby food fruit purées). Consume the mixture immediately, do not let the enzymes linger in your mouth, and follow with fluids to make sure all the granules are swallowed.

Timing the enzymes with your meals and snacks is important. Take the capsules RIGHT before you eat. The capsules' enteric coating dissolves in the small intestine releasing the enzymes and allowing them to aid in digesting the nutrients you are about to eat. If you eat a large meal that takes longer to eat or you are a slow eater, you can take half your dose at the start of the meal and the rest half way through your meal. Meal replacement drinks (Ensure®, Boost®), protein drinks, smoothies and shakes must also be taken with enzymes. You may find that that you need more enzymes with fatty foods.

The only foods that do not require you to take enzymes are fruit juice and fruit (fresh and dried fruit) when eaten alone. Also, you generally do not need enzymes when “nibbling” on very small, bite sized snacks or drinking beverages to which you added a very small amount of milk or creamer.

Taking the enzymes allows you to eat any foods you want because they help digest foods that you may have had problems eating, such as fat. You are encouraged to eat a broad diet including foods high in protein and fat

It is important to store the medication at room temperature and in a safe place. Avoid storing them in hot places such as cars. Carry enzymes in a small bag or container when away from home.

What if the PERT is not working?

Do not stop taking your enzymes if your symptoms persist - try increasing the dose and contact your medical team for help. The amount of enzymes you need to digest your food may seem high, however a normal pancreas releases 720,000 lipase units during a standard meal.

If you experience nausea or other problems, you may want to try another enzyme brand. Sometimes the capsule coating can cause these problems. If the number of capsules you need is more than 4 capsules per meal ask your medical team about changing your prescription. Some brands of enzymes have capsules that contain larger amounts of enzymes. If you switch to higher dose capsules, you may be able to take fewer capsules with meals.

Guidelines on Dosing Pancreatic Enzymes

When starting enzyme therapy, the standard dosing guidelines for adults is:

- Start with an average dose strength of 20,000 to 25,000 lipase units per capsule.
- Take 2-3 capsules with standard sized meals and 1-2 capsules with snacks and small meals.
- Take the capsules right before starting to eat.

Formulas for Calculating Pancreatic Enzyme Doses

These are other ways to calculate dosing for adults and older children:

Dosing based on weight:

- 2,500 lipase units x weight in kilograms for a standard meal
- e.g. for 150 lb. / 68 kg person x 2,500 lipase units = 170,000 lipase units for a standard meal
- (about 7 capsules of the 25,000 lipase unit capsules)

Based on grams of fat eaten:

- 500 - 2,500 lipase units/kg/meal
- e.g. for 150 lb. / 68 kg person x 500 – 2,500 lipase units = 34,000 – 170,000 lipase units per meal
- (1 – 7 capsules of the 25,000 lipase unit capsules per meal)

Source: Cystic Fibrosis Foundation Clinical Care Guidelines: <https://www.cff.org/Care/Clinical-Care-Guidelines/Nutrition-and-GI-Clinical-Care-Guidelines/Pancreatic-Enzymes-Clinical-Care-Guidelines/>

FAQ's

Can you take too many enzymes?

Very high doses of pancreatic enzymes have been associated with a condition called fibrosing colonopathy which can cause belly pain, distension, vomiting and constipation. It is recommended that you not exceed 6000 lipase units for every kilogram of body weight per meal.

e.g. for 150 lb. / 68 kg person

6000 lipase units x 68 kg x 1 meal = 408,000 lipase units per meal

Are there programs that can help reduce the cost of the enzymes?

Most of the companies that make pancreatic enzymes have financial assistance programs that can help reduce the cost of your prescription. However, these programs are generally only available to people under 65 years who are not on Medicare. Information about these programs is posted on the brands' website. If the cost of the enzymes is a concern, discuss this with your medical team and the pharmacist in your cancer center.

What are the vitamin deficiencies associated with steatorrhea?

People experiencing steatorrhea (fatty stools) may become deficient in fat soluble vitamins (vitamins A, D, E and K). There are special multivitamins that contain water soluble versions of these vitamins. If you are concerned about potential vitamin deficiencies discuss your concern with your medical team and ask for guidance on selecting a multivitamin. Some of the pancreatic enzyme brands offer these multivitamins for free through their patient assistance programs. For information go to the brand's website.

Are there religious restrictions to PERT?

Pancreatic enzymes are extracted from the pig pancreases. Since some religions do not allow pork products, patients needing these medications may feel they cannot take them. However, most religions allow dispensation from this restriction when a medicine or food is needed for health purpose. Talk to your religious leader about receiving dispensation.

What about over the counter enzymes?

Digestive enzymes available in health food stores generally do not contain any lipase, protease or amylase, and if they do, they have very low amounts. They generally contain plant enzymes. As with other OTC supplements, they are not required to meet standards for safety and standardization on dosing.

Who do I go to for help with questions about diet, managing symptoms and general issues regarding pancreatic enzymes?

In addition to your doctors and nurses, the Registered Dietitian Nutritionist at your cancer center can help you with your pancreatic enzyme medications concerns. They can also help you with other nutrition and diet related problems. Contact your medical team for a referral to their dietitian.

Resources for More Information

Helpful information on symptom management, dosing guidelines and financial assistance programs are available on the websites for the pancreatic enzyme brands.

- Creon: <https://www.creon.com/>
- Pancreaze: <https://pancreaze.com/>
- Pertye: <https://pertyecares.com/>
- Zenpep: <https://www.zenpep.com/>

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