

Exocrine pancreatic insufficiency (EPI)

The pancreas is an organ located in the upper abdomen behind the stomach, which produces 1.5 litres of digestive juices every day. Digestive juice contains enzymes which help to digest fats, carbohydrates and proteins in the food we eat. Every time we eat or drink anything except water, the pancreas produces juice to help with the digestion of nutrients. Exocrine pancreatic insufficiency (EPI) means that the pancreas does not work correctly for proper digestion to take place.

What are the main reasons for EPI?

- Acute and chronic inflammation of the pancreas (pancreatitis)
- Cystic fibrosis
- Pancreatic cancer
- Surgery of the stomach, pancreas or small bowel
- Previous treatment including radiotherapy or chemotherapy.

What are the symptoms of EPI?

Mild EPI may not cause any symptoms or can present with mild abdominal discomfort and bloating with normal-appearing bowel movements.

Moderate or severe EPI results in bloating, cramps and increased flatulence (wind). Stool is frequently loose, greasy, pale, foul-smelling and difficult to flush (steatorrhoea). You may also develop deficiencies in fat soluble vitamins (A, D, E or K) and weight loss.

How is EPI diagnosed?

At The Royal Marsden we measure the levels of faecal elastase (enzyme produced by the pancreas) from a solid or semi-solid stool sample. If the levels are low, a diagnosis of EPI is made. In this case we might ask you to have a CT or MRI scan of your pancreas if the cause of the EPI is not obvious from your past medical history.

How is EPI treated?

Pancreatic enzyme replacement therapy is taken orally and is the most common form of treatment. There are several different brands of pancreatic enzymes available and all are made from porcine (pig) pancreas*. At The Royal Marsden our preferred treatment is the enteric-coated Creon which comes in 10,000 or 25,000 units capsules.

The usual dose is 20,000-50,000 units with each snack and 50,000-100,000 units with each meal.



To be effective, the capsules should be taken:

- Every time you eat or drink anything except water
- With every snack, however small
- Entirely at the beginning of a meal or, alternatively, with one half of the total dose at the beginning of the meal and the other half taken in the middle of the meal. This dosing regimen ensures that there will be appropriate mixing of enzymes with food.

The capsules can be swallowed whole, or for ease of administration they may be opened and the granules taken with acidic fluid or soft food, but without chewing. This could be apple sauce or yoghurt or any fruit juice with a pH less than 5.5 such as apple, orange or pineapple juice. Crushing and chewing the granules or mixing with food or fluid with a pH greater than 5.5 can disrupt the protective enteric coating. This can result in early release of enzymes in the oral cavity and may lead to reduced efficacy and irritation of the mouth.

Additional treatment

People with exocrine pancreatic insufficiency are at risk of developing deficiencies in:

- Fat soluble vitamins (A, D, E, K)
- Micronutrients (also known as trace elements) such as zinc.

We recommend a discussion with your doctor and dietitian to decide which (if any) vitamin and trace element supplements should be prescribed for you.

Pancreatic enzyme replacement therapy is generally well-tolerated, however, some people find that they become constipated. If this happens, please discuss this with your doctor. Generally, we recommend that if this happens, then people should **not** reduce their intake of the enzymes because this might lead to them failing to absorb nutrients from their food. Instead, usually we recommend that in addition to full dose enzyme replacement, they take laxatives to ease the constipation, such as a regular sachet of normacol or regular sodium docusate.

Side effects

Side effects may include:

- Abdominal cramps
- Constipation
- Nausea
- Vomiting.
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*Some patients become anxious about this for religious reasons, however, organisations representing Jews and Muslims have stated that using these products is acceptable, as there is no alternative. Should you have any concerns about this then please speak to a member of the GI team.



Contact details

For further advice about taking Creon, please contact The Royal Marsden Macmillan Hotline who can then put you through to the Pharmacy Medicines Helpline (Monday to Friday, 9am - 5pm)

GIANTS (GI and Nutrition Team Service)

0207 811 8216 or 8106

Alternatively, please call

The Royal Marsden Macmillan Hotline:

020 8915 6899

(available 24 hours a day, 7 days a week)

