

**YOU AND  
YOUR BODY**



# DIABETES AND PANCREATIC EXOCRINE INSUFFICIENCY

## ➤ WHY IS THIS LEAFLET FOR YOU?

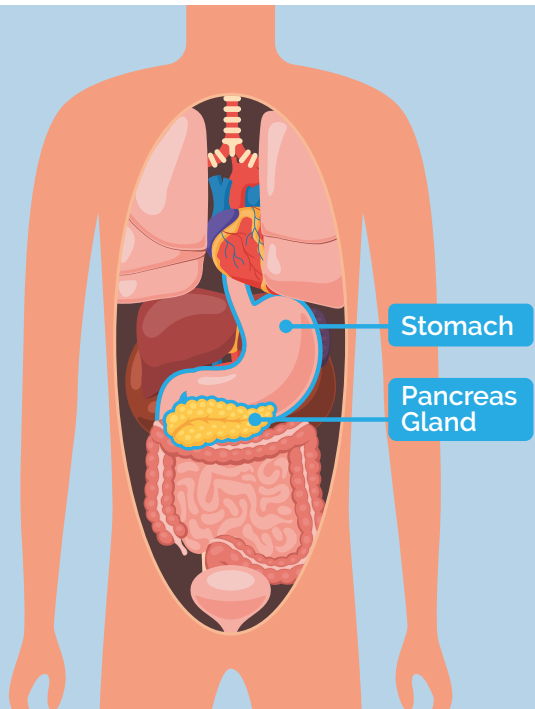
Pancreatic exocrine insufficiency (PEI) is important to understand in diabetes care due to the changing functions in the pancreas. This leaflet will give you essential information on:

- What is PEI?
- What are the symptoms?
- How is it treated?
- How to get the most out of your treatment
- How PEI affects your diabetes



## > WHAT IS PANCREATIC EXOCRINE INSUFFICIENCY?

The pancreas gland lies underneath the stomach. It produces insulin which is secreted directly into the blood (endocrine), and digestive enzymes which are secreted via ducts into the gut (exocrine). Insulin controls blood glucose levels. A total or partial lack of insulin results in diabetes.



Digestive enzymes secreted by the pancreas break down the food you eat (fats, proteins and carbohydrates), so that it can be absorbed from your gut into the bloodstream. Pancreatic exocrine insufficiency (PEI) means the pancreas does not produce enough digestive enzymes to digest food properly. This means that your body may not get all the nutrients it needs, especially fat-soluble vitamins. This is called malabsorption.

### **How is it diagnosed?**

PEI is diagnosed by testing a sample of your stool for an enzyme called faecal-elastase-1.

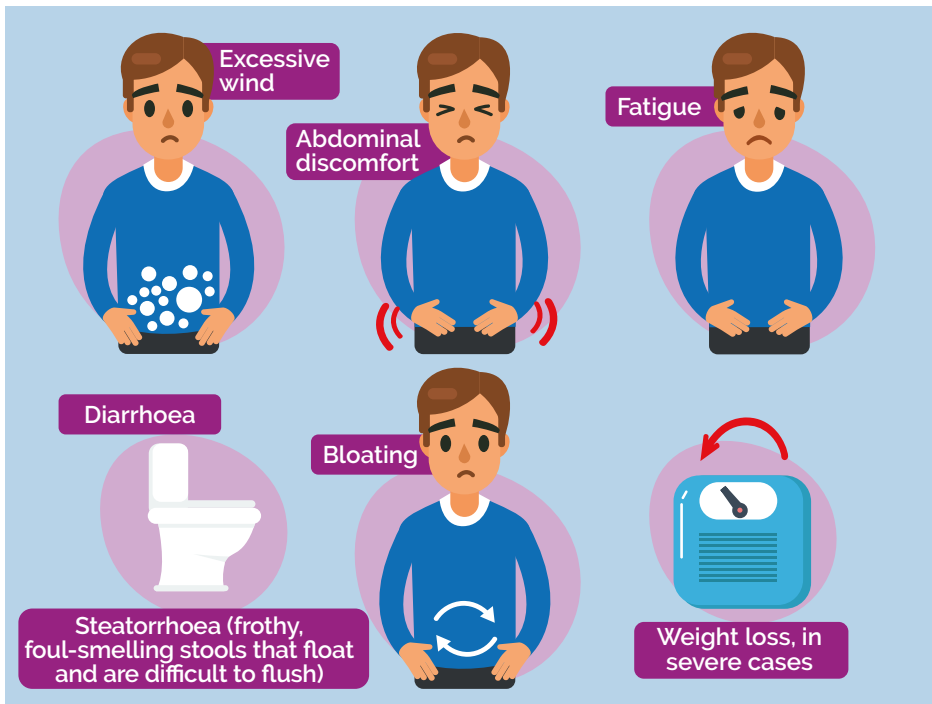
## Who is at risk?

You may be at particular risk if you have or have had the following:

- ❗ Surgery to your pancreas and stomach
- ❗ Acute Pancreatitis
- ❗ Chronic Pancreatitis
- ❗ Cystic Fibrosis
- ❗ Pancreatic Cancer

If left untreated, PEI can lead to malnutrition and this may result in bone weakness (osteoporosis, osteopenia), and deficiency of fat-soluble vitamins (A, D, E and K) which may lead to further complications.

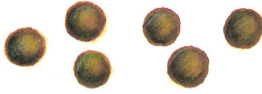
## > WHAT ARE THE SYMPTOMS?



- ❗ PEI may potentially be responsible for variable glucose control in people with diabetes.

You can use this chart to show your doctor what your stools look like:

TYPE 1



Separate hard lumps, like nuts  
(hard to pass)

TYPE 2



Sausage-shaped but lumpy

TYPE 3



Like a sausage but with cracks on  
its surface

TYPE 4



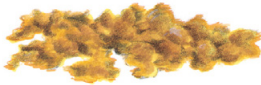
Like a sausage or snake, smooth  
and soft

TYPE 5



Soft blobs with clear-cut edges  
(passed easily)

TYPE 6



Fluffy pieces with ragged edges, a  
mushy stool

TYPE 7



Watery, no solid pieces, entirely liquid

Your doctor will want to exclude other conditions that have similar symptoms and may be associated with diabetes. This includes; diabetic neuropathy, coeliac disease or an intolerance to metformin as well as conditions that are not associated with diabetes, such as irritable bowel syndrome.

## > HOW IS PEI TREATED?

### Pancreatic enzyme replacement therapy (PERT)

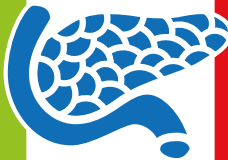
PEI is treated by replacing the enzymes that are not being produced by the pancreas, usually in a capsule form. The medication should be swallowed whole, not crushed or chewed, with a cold drink. Hot drinks will stop the enzymes working properly.



To work effectively, these enzymes need to be taken each time you eat or have a milky drink, including meals and snacks. Take them just before you begin eating or with the first few mouthfuls of food as they need to be taken with food/milky drinks to work. If you take more than one capsule you should space them out throughout your meal or snack.

If you are unable to swallow the capsules or you have been prescribed granules, open them carefully and mix the granules (without crushing them) in a spoonful of soft acidic food or drink such as yoghurt or apple juice. Do not chew. Swallow immediately as PERT may cause irritation to the tissue inside your mouth causing ulcers. Follow this with a cold drink to wash any residue from your mouth.

In someone without PEI  
Pancreas produces  
around 720,000 units for  
a 300 to 600 kcal meal



In someone with PEI  
The usual starting dose  
for PERT is 50,000 units  
with meals and 25,000  
units for snacks

This therapy aims to replace the digestive enzymes your pancreas is unable to produce.

! Pancreatic enzyme supplements are made from pork products. There is currently no alternative.



## › GETTING THE MOST OUT OF YOUR TREATMENT



- › **Keep your treatment at room temperature.** As it is damaged by high temperature and may also be affected if you keep the capsules or granules in your pocket.



- › **Use by the expiry date.**



- › **Your doctor will adjust the dose to suit you.** This is until you have relief from diarrhoea and abdominal symptoms. Continue taking the treatment even when you feel better.



- › **Stop smoking.**



- › **Some foods do not need PERT.** These are generally fat-free foods, such as fruit and vegetables (except avocados) and sugar (e.g. jam, honey, fruit juice, fizzy drinks, jelly, boiled sweets, sorbets and fruit lollies). Everyone should aim to eat healthily, but if you have PEI, you should eat a nutrient-rich diet. If you need advice about this, ask to see a dietitian.



- › **You may take fat-soluble vitamins (e.g. A, D, E, K) and mineral supplements.** However, if the treatment is effective and you eat a nutrient-rich diet, supplements are usually unnecessary.



- › **Cut out alcohol.**



- › **Frequent diarrhoea can make your anal area sore.** This should improve when you have found the right dose of PERT, but using a barrier cream can protect tender skin in the meantime. Washing gently after every bowel motion will help to prevent soreness.

## > HOW PEI AFFECTS YOUR DIABETES

Pancreatic enzymes are needed to digest carbohydrates found in starchy and sugary foods, so if you have PEI, you may have difficulty controlling your glucose levels.

When you start to digest and absorb food properly during PERT, especially if you regain weight, you may find a change in your glucose levels. If you are able to test your glucose, you should monitor more until your PERT is stable, as your diabetes tablets or insulin doses may need adjusting.



**⚠ Insulin and some diabetes tablets can cause low glucose (hypoglycaemia). Check with your pharmacist if you are not sure if this is a side effect of your treatment. Low glucose readings should be treated immediately with quick-acting glucose which does not require PERT, but if you follow this with a starchy snack, you will need to take PERT with this.**

## > REPORTING OF SIDE EFFECTS

Please be aware some side effects may be experienced with PERT. Consult your product patient information leaflet or speak to your healthcare professional if you need further information .

## > KEY POINTS:

- ❗ Pancreatic Exocrine Insufficiency (PEI) may affect people with diabetes.
- ❗ A simple test can diagnose the condition.
- ❗ If you think you have symptoms, discuss with your healthcare professional.



## > USEFUL RESOURCES:

[www.diabetes.org.uk](http://www.diabetes.org.uk)  
[www.gutscharity.org.uk](http://www.gutscharity.org.uk)  
[www.pancreatitis.org.uk](http://www.pancreatitis.org.uk)  
[www.pancreaticcancer.org.uk](http://www.pancreaticcancer.org.uk)  
[www.pancreaticcanceraction.org](http://www.pancreaticcanceraction.org)  
[www.trend-uk.org](http://www.trend-uk.org)

Please note Mylan has had no involvement in any of the websites listed above.



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