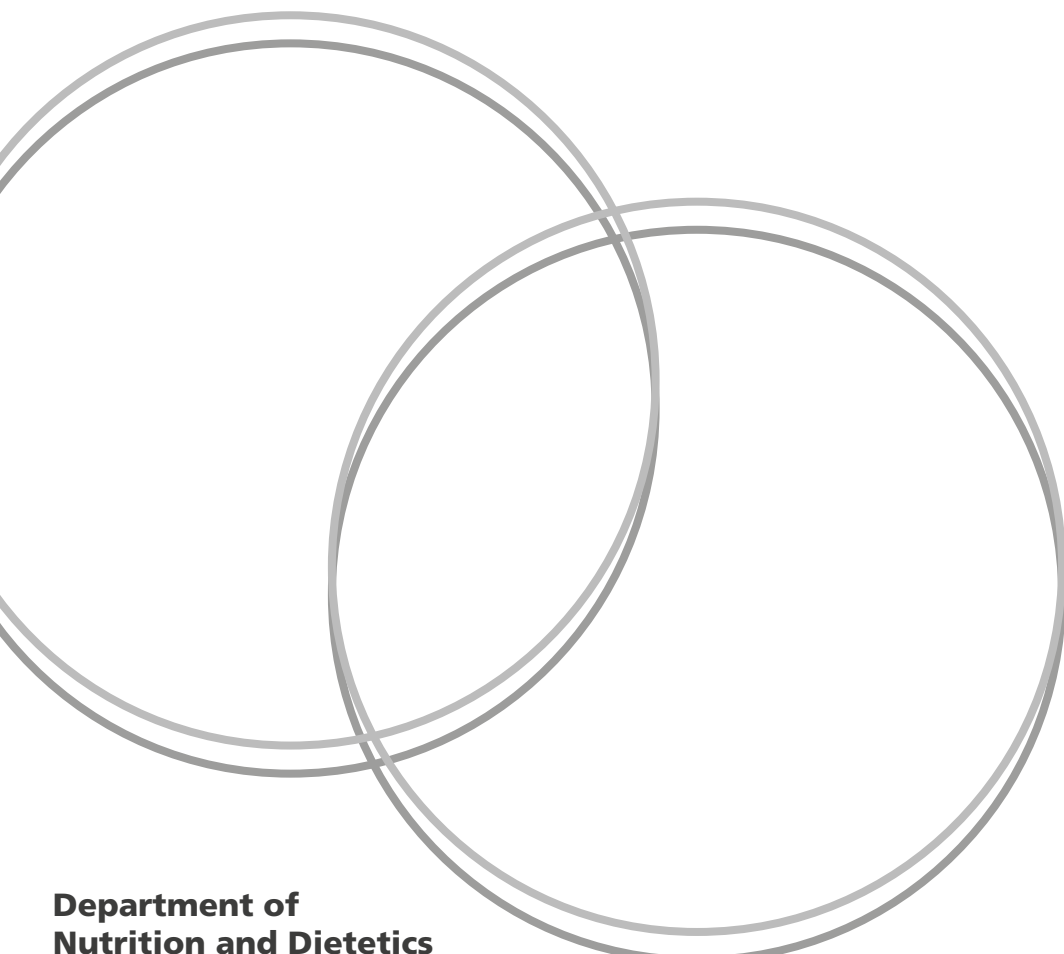


Pancreatic Surgery: Nutrition Advice

**Nutrition information for patients who
have had surgery involving the partial
or complete removal of their pancreas.**



The pancreas

The pancreas is an organ that produces **digestive enzymes** which break down fat, protein and carbohydrates in food and drink, so they can be absorbed from your gut into your bloodstream. It also **produces hormones** (including insulin and glucagon) to help control blood sugar levels.

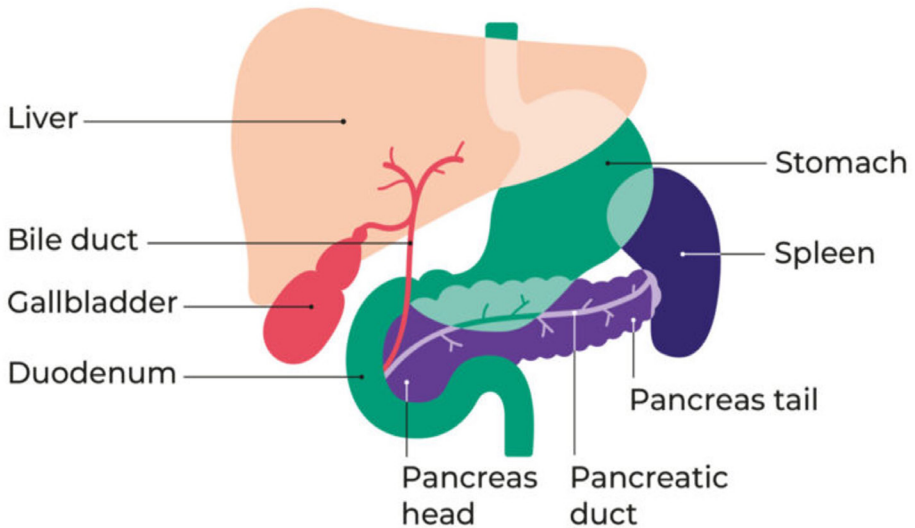


Figure 1 – Diagram showing the pancreas and the surrounding organs

Pancreatic surgery includes procedures such as:

- Total Pancreatectomy
- Whipple's Procedure
- Pylorus-Preserving Pancreaticoduodenectomy (Modified Whipple's)
- Distal Pancreatectomy

Depending on which type of pancreatic surgery you have, **some or all of the following nutrition information may be relevant to you**. Your dietitian, doctor or specialist nurse will help to guide you with this.

- ☐ Eating well for Enhanced Recovery After Surgery (ERAS)
- ☐ Pancreatic Enzyme Replacement Therapy (PERT)
- ☐ Type 3c Diabetes

Eating well for Enhanced Recovery After Surgery (ERAS)

Nutrition is important for promoting healing and your recovery after your surgery. However, you will need to introduce food and fluids gradually until your bowel is fully functioning. When you are allowed to start eating again, you need to eat foods that your bowel can easily digest and absorb, which are typically softer and lower fibre foods. Most people are able to return to a healthy balanced diet after 4 weeks.

You might find that you have a small appetite or are unable to eat as much as usual following your pancreatic surgery. It is important to get enough nutrition to help your body heal and to maintain your strength. The following strategies may be helpful to increase your nutrition intake:

Do:

- Have 5-6 small meals and snacks spread over the day, rather than 3 larger meals
- Use a smaller plate
- Try to eat slowly. Take time with your meals
- Over the entire day aim to include the following:
 - » 3-5 portions of protein
 - » 5 portions of carbohydrates
 - » 2 portions of fruit
 - » 3 portions of vegetables or salad
 - » 2 portions of calcium containing foods or drinks (i.e. cow's milk or non-dairy calcium fortified milk, yoghurt, cheese, tahini, calcium fortified cereals).

- Drink 2000ml of fluids daily, and choose nourishing drinks such as milk, smoothies, vegetable juices, soups and supplement drinks (e.g. Vital 1.5®, Fortisip®, Aymes Shake®, Complan®).
- Prioritise eating the protein portions of your meals as this will help wound healing and preserve your muscles (e.g. beans, lentils, nuts, tofu, eggs, cheese, yoghurt, meat, fish, chicken, Quorn®).
- Use full fat products to fortify foods – add milk powder, cheese, olive oil, avocado, cream, butter or vegetable spread to foods to increase calorie content.

Do not:

- Do not finish everything on your plate if you feel full.
- Do not eat large portions of very high fibre foods. They may make you feel uncomfortably full (i.e. wholemeal bread / pasta, green salads, beans, pulses). You can reintroduce these after one month following surgery.
- Do not drink large amounts of liquids just before or with meals. These can fill your stomach and make you less hungry.

For more information on portion sizes and a balanced diet, scan the QR code:

www.nutrition.org.uk/media/pwdjfvj5/your-balanced-diet_16pp_final_web.pdf



Pancreatic Enzyme Replacement Therapy (PERT)

Following pancreatic surgery, you may no longer produce enough digestive enzymes to help absorb the food and drinks you are consuming. When this happens, one or more of the following symptoms can occur:

- Oily or fatty stools (stools may be surrounded by an orange oil)
- Pale, orange or yellow stools, which may float and be difficult to flush away
- Offensive smelling stools
- Wind, flatulence, bloating, abdominal pain or cramping
- High or low blood glucose (sugar) levels
- Difficulty gaining or maintaining weight
- Vitamin and mineral deficiencies

To absorb food properly and avoid these problems you will need to take pancreatic enzymes in the form of a capsule when you eat or drink most foods. This is called pancreatic enzyme replacement therapy (PERT).

Your Dietitian has recommended the following as your pancreatic enzyme capsule starting dose:

Creon 25,000 unit capsules _____

_____ with meals (breakfast, lunch, dinner)

_____ with snacks, puddings, milky drinks (food between meals)

_____ with large or high fat meals

The dose should be adjusted based on the type and size of your meal.

This may sound like a high amount, however your pancreas would usually produce more than 700,000 units of fat digesting enzymes (lipase) for a small meal (e.g. more than x28 capsules of Creon 25,000®).

If you suspect you are not digesting food well, you may need to increase your PERT capsule dose by 1 capsule per meal and snack until your symptoms resolve.

You may be advised to take an antacid, which helps to neutralise stomach acid to support the function of the pancreatic enzymes. Examples of this are Omeprazole and Lansoprazole.

Your dietitian or doctor can help guide you with this.

Following pancreatic surgery your body is less able to digest food. Therefore, it is recommended that you take a daily A-Z complete multivitamin & mineral tablet to prevent any deficiencies in the long term. This is a lifelong recommendation.

Top tips for taking PERT capsules

When to take?

- Take the PERT capsules with all meals, milky supplement nutrition drinks, snacks, puddings and milky drinks.
- Do not take the PERT capsules without food or milky drinks as this will not be helpful.
- You do not need to take PERT capsules with squashes, fizzy drinks, tea or with sugary sweets (e.g. jelly babies).
- If you have some pancreas remaining (Whipple's), then you do not need to take enzyme capsules with small amounts of fruits and vegetables (except for with avocados and potatoes).
- If you have had all of your pancreas removed (total pancreatectomy) then you need to take PERT with all meals, snacks and drinks.

How to take?

- Split the dose between the start and halfway through the meal or drink (e.g. take 1 capsule at the beginning and 1 halfway through).
- Swallow the capsules whole with a cold drink. Taking capsules with hot drinks will damage the capsules and enzymes (you can still have hot food and drinks, but don't use these to swallow the capsules).
- If you cannot swallow the capsules, they can be opened and the granules must be mixed with a cold and acidic food item (i.e. fruit puree, yoghurt). This is to stop the enzymes working in the mouth. You will need to swallow the mixture straight away, without chewing, and thoroughly rinse your mouth afterwards.
- Do not sprinkle the granules directly on a plate of food as the enzymes will not work and may cause mouth ulcers.

How to store?

Do not store the capsules in hot places that go above 25 degrees Celsius regularly (e.g. do not leave them in your car, in direct sunlight, on windowsills or in your pocket). Some PERT need storing in the fridge. Ensure PERT is stored appropriately as per the manufacturer's specification.

Use this QR code for more information and to watch the video:

Pancreatic Enzymes: a guide for patients

www.youtube.com/watch?is=oQii0Wu83Rs35ZAT&v=TBjfbIYjf-k&feature=youtu.be



Type 3c Diabetes

Following pancreatic surgery, you may no longer produce enough of the hormones that help control your blood glucose (sugar) levels (e.g. insulin). Therefore you may develop a type of diabetes called type 3c diabetes. If this is the case for you then the diabetes team will review your medication needs.

Management

You will be given a blood glucose monitor so that you can check your own blood glucose level. This is done by pricking your finger to produce a small drop of blood, which is put onto a measuring strip in the monitor. The monitor then tells you what your blood glucose level is within a few seconds.

The QR code below takes you to a video from Diabetes UK:

How to test your blood sugar | 7 simple steps

www.youtube.com/watch?v=NUskHI7APHE



Your doctor will be asked to perform a blood test to check your HbA1c level. HbA1c indicates an average of your blood glucose levels for the previous two to three months. A high HbA1c means you have had high levels of glucose in your blood. This measure will help assess your risk of developing long-term diabetes complications.

Dietary considerations

If you have developed diabetes, then eating foods containing sugar and carbohydrates will affect your blood glucose levels. All the carbohydrates you eat and drink are broken down into glucose. The type and amount you consume can make a difference to your blood glucose levels and diabetes management.

Carbohydrates are needed as part of a healthy balanced diet. They provide us with energy, fibre, vitamins and minerals. However the more carbohydrate you eat in one go the higher the blood glucose levels will be after a meal.

The table below shows the foods that affect blood glucose levels.

Types	Examples
Starchy carbohydrates	Bread i.e. white, brown, pitta, sour dough, rye, multigrain, pumpernickel, roti, dosa, chapati Potatoes, sweet potato, yam, cassava Pasta and noodles Grains i.e. rice, quinoa, bulgar wheat, couscous Lentils, beans Breakfast cereals i.e. oats, corn, barley, bran Flour
Food with added sugars	Fizzy drinks, sweets, chocolate, cakes, biscuits, jams, honey, syrups
Foods with natural sugars	Fruit, milk, plain yoghurt

Tips for managing your blood glucose with diet:

- Eat moderate amounts of starchy carbohydrate foods spread over the day to avoid your blood glucose levels fluctuating too much.
- These foods will have little to no effect on your blood glucose levels:
 - » Protein foods (e.g. meat, fish, chicken, Quorn®, nuts, seeds, tofu, eggs, cheese)
 - » Vegetables and salad (except potatoes)
 - » Butter & oils
- Eating carbohydrate foods alongside foods high in protein, vegetables, fibre and healthy fats slows down your rate of digestion, therefore reducing blood glucose spikes.
- If you are prescribed a nutritional supplement drink then sip this slowly to avoid blood glucose rising too quickly.
- If you are on insulin, it is important to still include starchy carbohydrates in your diet as eating a meal without a carbohydrate can make your blood sugar levels drop too low (hypoglycaemia). This may also occur if you skip a meal.

If you have lost or are losing weight it is important to manage any high blood glucose levels with medication rather than limiting your nutritional intake. The diabetes nurse or your GP can advise on Insulin.

Further support

Oxford University Hospitals Dietitian

Phone: **01865 235 130**

Pancreatic Cancer UK services

For information and support regarding pancreatic cancer.

www.pancreaticcancer.org.uk

Phone: **0808 801 0707**

(Mon, Tue, Thurs, Fri 10am-4pm)

Diabetes UK

For information on managing different types of diabetes.

www.diabetes.org.uk

Phone: **0345 123 2399**

(weekdays 9am-6pm)

Macmillan Cancer Support

For practical, medical and financial support for anyone affected by cancer, including family members.

www.macmillan.org.uk

Phone: **0808 808 0000**

Notes

Notes

Further information

If you would like an interpreter, please speak to the department where you are being seen.

Please also tell them if you would like this information in another format, such as:

- Easy Read
- large print
- braille
- audio
- electronic
- another language.

We have tried to make the information in this leaflet meet your needs. If it does not meet your individual needs or situation, please speak to your healthcare team. They are happy to help.

Author: Macmillan HPB Dietitian

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Oxford University Hospitals NHS Foundation Trust

www.ouh.nhs.uk/information



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