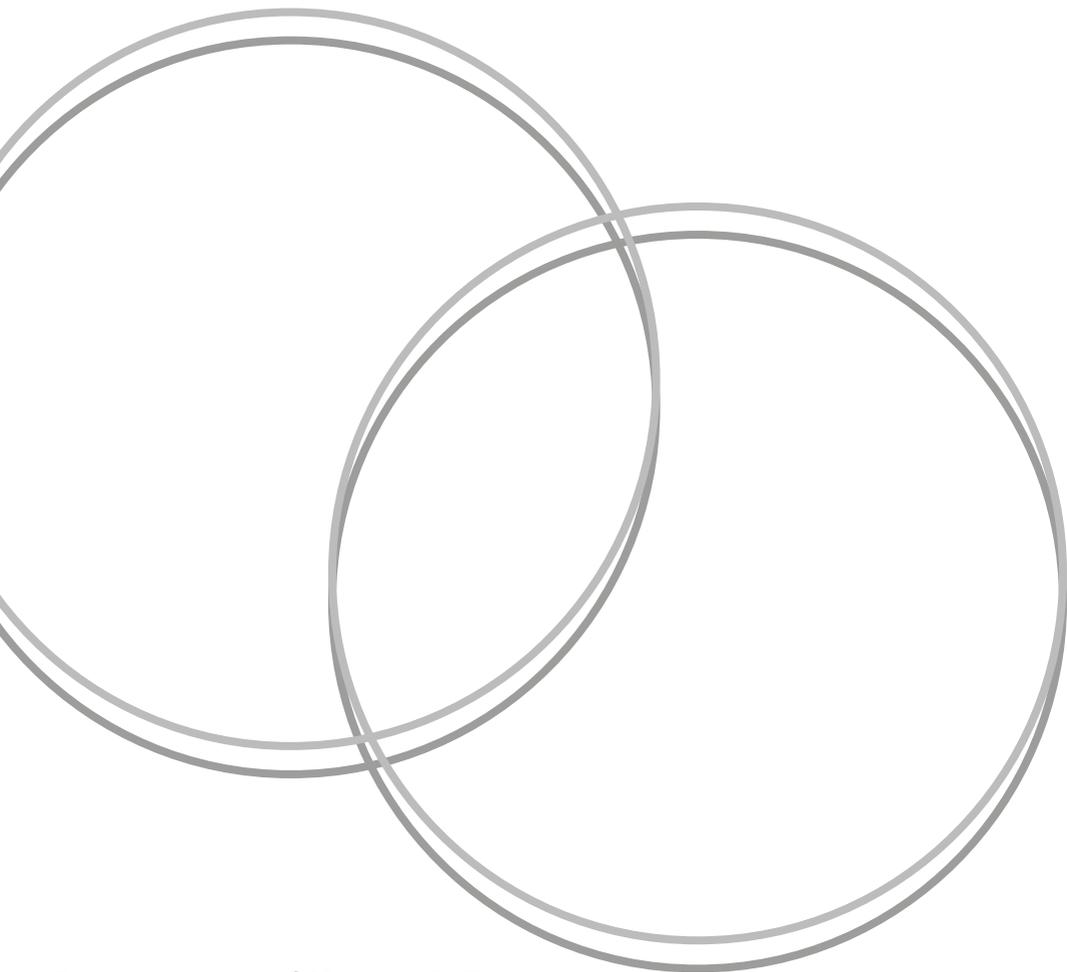


About Pancreatic Surgery

A guide for patients and relatives



**Department of Hepatobiliary
and Pancreatic Surgery**

This booklet has been written to provide information about the surgical procedures that are commonly performed for pancreatic disorders. These procedures are used in the management of several conditions involving the pancreas, such as benign pancreatic growths, pancreatic cancers, and pancreatitis (acute or chronic). Much of the information in this booklet is about surgery for pancreatic cancers.

The majority of surgical procedures performed on the pancreas will involve resection (removal) of the portion that is affected.

The type of surgical operation for pancreatic tumours depends on the location of the tumour in the pancreas and on the type of the tumour.

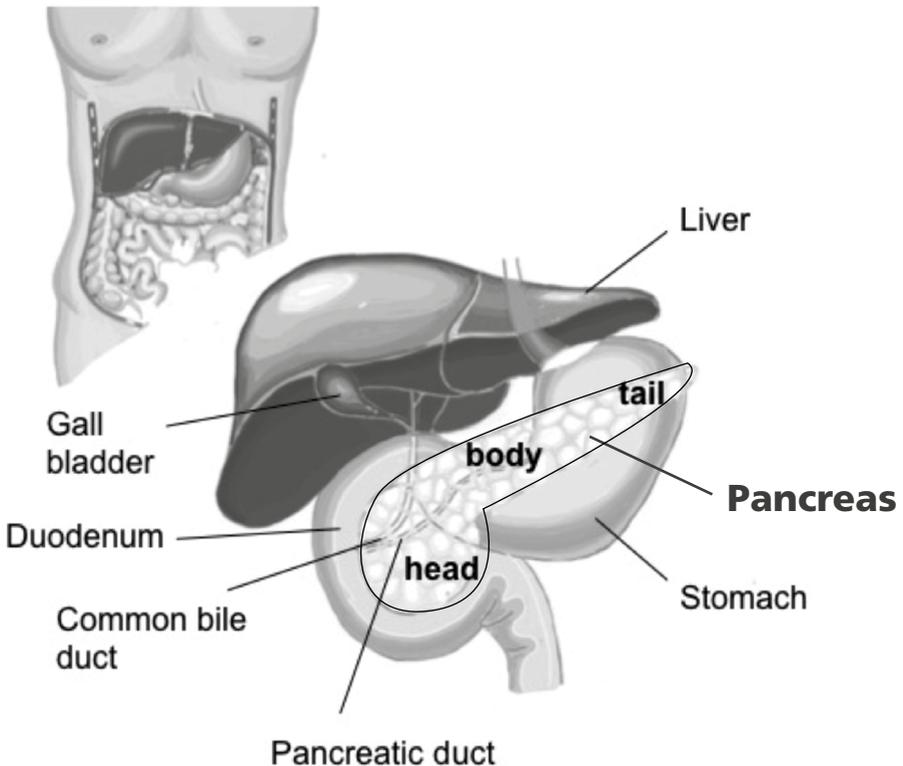
What is the pancreas?

The pancreas is a gland that lies at the back of the upper abdomen, behind the stomach. It is shaped like a tadpole; the rounded head lies attached to the duodenum (a part of the intestine that forms the outlet of the stomach), while the body and tail extend across to the left side.

The pancreas produces digestive juices and aids digestion of food. Pancreatic juice and bile mix with food in the intestine and help digestion.

The pancreas also produces insulin, which controls the level of sugar in the blood. Lack of insulin causes diabetes.

The pancreas and its location in the body



Types of operation

The operation to remove the head of the pancreas is called pancreaticoduodenectomy.

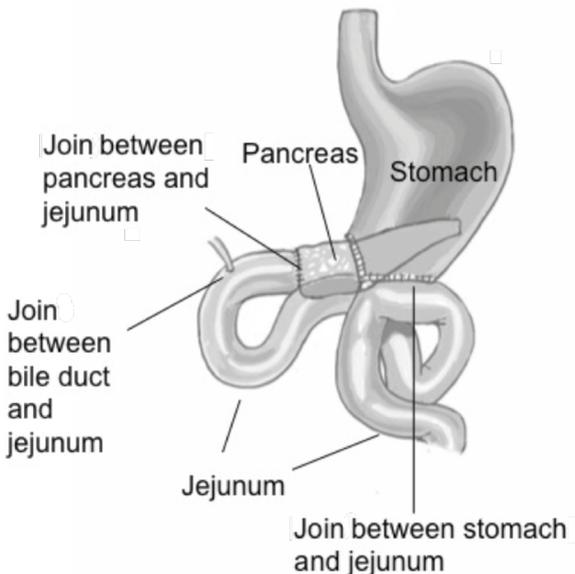
There are two types of pancreaticoduodenectomy: the Whipple's procedure and the pylorus preserving pancreaticoduodenectomy (PPPD). Your surgeon will decide on whether to carry out a Whipple's or PPPD operation, depending on the type of tumour that you have and what is seen during your operation.

Whipple's procedure

In the Whipple's procedure, the head of the pancreas, lower quarter of the stomach, common bile duct, gallbladder, duodenum (first part of the intestines) and surrounding lymph nodes are removed. The remaining pancreas, bile duct and stomach are then rejoined to the small intestine (jejunum). This allows pancreatic juice, bile and food to flow back into the small intestine, so that digestion can carry on as normal.

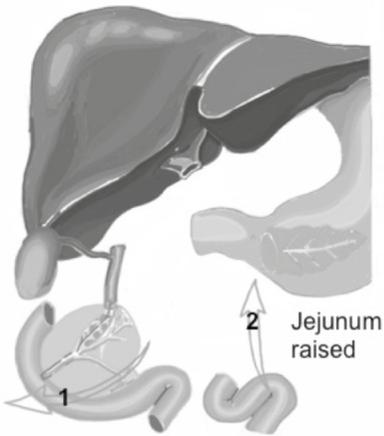
The operation normally takes 4 to 7 hours. It can sometimes be carried out as a keyhole or robotic procedure.

Reconstruction following a classical Whipple's procedure

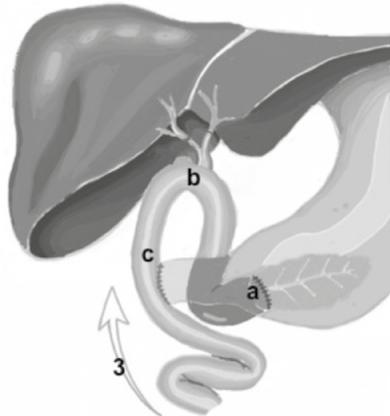


Pylorus-preserving pancreaticoduodenectomy (PPPD)

The PPPD is a variation of the original Whipple's operation, but the lower end of the stomach is not removed. This leaves the valve (pylorus) which controls the flow of food from the stomach. It is otherwise a very similar procedure with similar risks.



Duodenum, head of pancreas, bile ducts and gallbladder removed

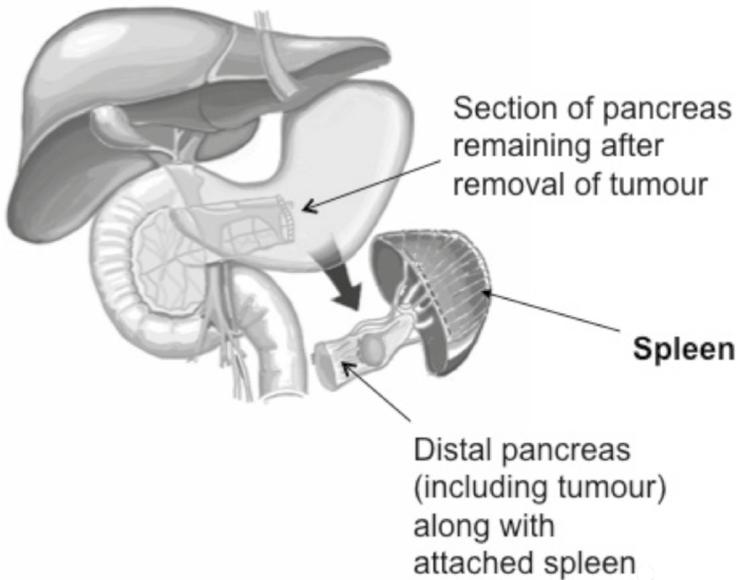


Jejunum re-attached to a) Pancreas
b) Hepatic duct
c) Pylorus

Distal pancreatectomy

If the problem is in the tail of the pancreas, your surgeon will recommend an operation called distal pancreatectomy (removal of the tail of the pancreas). Quite often this operation may also require removal of your spleen. This operation can often be carried out laparoscopically, through small holes in your abdomen (keyhole surgery), and this may be offered to you.

Distal pancreatectomy



Splenectomy

Splenectomy is removal of the spleen. The spleen helps the body's defence against some infections. Without a spleen your immunity to those bacteria is reduced. If it is likely we will need to remove your spleen during surgery we will write to your GP to ask for you to have specific vaccinations, preferably before the spleen is removed.

You will be advised to have the following vaccinations:

- Meningitis B and C - preferably 2 weeks before surgery.
- Meningitis B and Meningitis ACWY vaccine (ACWY are strains of the most common meningitis bacteria) - 1 month after surgery.
- Pneumococcal polysaccharide vaccine should also given prior to removing the spleen and every five years thereafter.

In addition, certain age groups will be advised to take penicillin or a suitable alternative for at least 2 years after surgery to help prevent infection.

Total pancreatectomy

This operation involves the removal of the whole pancreas. It is essentially a combination of the pancreaticoduodenectomy and the distal pancreatectomy.

You will become permanently diabetic following removal of the whole pancreas, as the pancreas is where the insulin for your body is produced. You will need to take insulin for the rest of your life.

You will be given more information about being diabetic and will need on-going support from a diabetes nurse. This will usually be at your GP's surgery or you may be followed up by the diabetes specialist at your local hospital.

In some cases, people who were expected to have a Whipple's procedure will need to have a total pancreatectomy. This is occasionally necessary if the tumour is more extensive than expected.

You may be offered Minimally Invasive Robotic Surgery for the pancreas. This is a type of keyhole operation using a 3D camera rather than the 2D camera type used in traditional keyhole surgery. The instruments are controlled by the surgeon controlling the robot. Your surgeon will let you know if this type of operation is recommended for you.

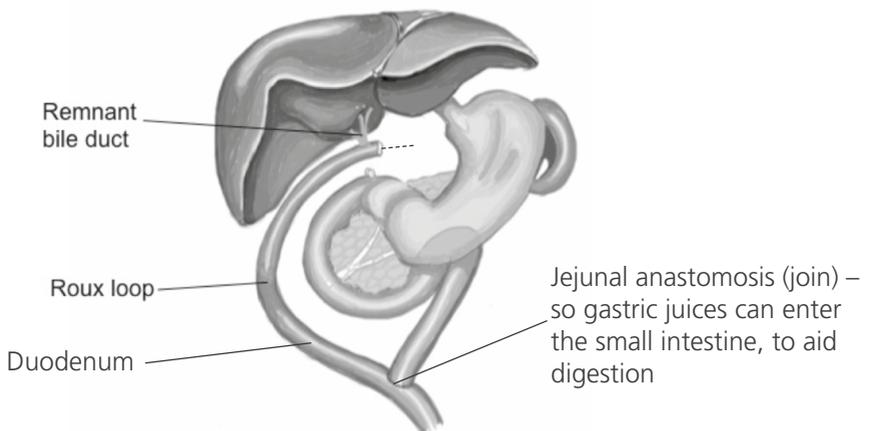
Bypass procedure

If your surgery is for suspected cancer, during the surgery your surgeon may find that it is not possible or advisable to remove the growth. Such a situation arises in 7 to 10 cases in 100 (7 to 10%).

This may be because the tumour has spread to another location, like the liver. It could also be because the tumour has grown beyond the pancreas and become fixed to important blood vessels close by.

In these circumstances your surgeon will not remove the tumour and may carry out a bypass procedure, to improve symptoms and prevent blockage of the bile duct or stomach in the future. This is done with a 'y' shaped bowel reconstruction called a Roux en Y bypass.

Roux en Y bypass procedure



What are the benefits of surgery?

Without surgery, the average survival of people with pancreatic cancer is less than one year, and very few survive more than 2 years.

The operation aims to completely remove the cancerous growth, and give the best chance of curing the problem. The chance of the cancer recurring depends on the type of tumour that you have.

A successful operation can increase your chance of being cured to between 10 to 50%. This will only be accurately known after the operation, when the pathologist examines the removed pancreas. Your surgeon will receive the full pathology report 2 to 3 weeks after surgery.

If you are having surgery for another condition, we will talk with you about the potential benefits.

What alternative treatments are available?

If you have cancer, chemotherapy may be able to shrink the cancer or delay its growth. If the cancerous tumour has not spread, but cannot be removed surgically because it is extending to nearby structures, then you may be recommended a combination of chemotherapy and radiotherapy. However, without surgery it is unlikely we will be able to cure this problem.

If you do not have cancer, it is unlikely there will be any alternative treatments.

Before your operation you will need an anaesthetic assessment to check it is safe for you. Some people will require a more in-depth assessment called CPET or cardiopulmonary exercise test which involves a short period of pedaling on an exercise bike while some measurements are taken by the anaesthetist. You will also be given a powerbreather device to use and referred to the Prehabilitation service to help optimise your fitness before the operation. The powerbreather helps to strengthen the lung muscles and helps to reduce the risk of a chest infection after an anaesthetic.

It can be helpful to bring the powerbreather in with you when you come in to hospital to use during your recovery.

What anaesthetic will I have?

Our usual anaesthetic technique for pancreatic surgery is a combination of general and local anaesthetic. You are put completely to sleep, and a tube is put into your windpipe, so it is not uncommon to get a sore throat after the operation.

You are likely to have several tubes attached to you after your surgery. These will include narrow tubes, called wound infusers, to give pain medication infusions into your wound (local anaesthetic infusion). These tubes will stay in place for 3 to 5 days. They are very fine, so you will be able to lie, sit, and walk comfortably

This type of pain relief is very safe and helps you to breathe deeply. The risk of any permanent nerve damage is very rare, less than 1 in 10,000.

After the operation you will receive pain relief medication directly via the wound catheters which can be increased if needed.

The team at the pre-assessment clinic can guide you and help with any questions that you have. They will also discuss with you our Enhanced Recovery After Surgery programme, known as ERAS, which can help you make a safe steady recovery as quickly as possible. It is known that starting to move around soon after surgery reduces the risk of complications.

You will also have a chance to meet the anaesthetist on the day of the operation to ask them any questions you might have.

You may need to be monitored in the Intensive Care Unit (ICU) after surgery, but most people will be transferred to the Churchill Overnight Recovery Unit (CORU) after the operation is complete.

What are the risks and possible complications?

Pancreatic operations are major procedures, with associated risks and complications. Nowadays, the operation has become much safer. This is mainly as a result of pancreatic surgery being carried out by a smaller number of surgeons, who have more experience in this type of surgery. At Oxford, over 70 pancreatic resections are performed annually, with less than 2.5% risk of death.

If you have other medical problems, your risks may be higher than average. Complications following pancreatic surgery occur in 20 to 50 in 100 patients, but the team at Oxford is experienced in managing these complications. Possible complications include:

- Those related to general anaesthesia and the epidural.
- Chest infection and problems with breathing.
- Bleeding, which may result in blood transfusion.
- Wound infection.
- Blood clots forming in the legs.
- Anastomotic leak (1 in 10 patients):
After the tumour is removed, the cut ends of the pancreas, bile duct and stomach are sewn to the intestine. Pancreatic juice or bile can leak into the abdomen (space around the organs). Your surgeon will leave a drain tube in your abdomen to remove any leaked pancreatic fluid. Most anastomotic leaks will heal on their own, but you will need longer to recover. If it does not stop leaking, you will need a further operation, and the entire pancreas may then need to be removed.
- Delayed emptying of the stomach (1 in 10 patients):
After the surgery, you will not be allowed to eat until your bowel function has returned. This usually takes 2 to 3 days. Sometimes the stomach may take longer to recover after surgery. During this time, you may need to receive nutrition through a feeding tube or intravenously (into a vein) for several weeks.

- Delayed bleeding (1 to 3 in 100 patients):
If there is an anastomotic leak, the fluid that leaks out can cause erosion of nearby blood vessels. This can cause internal bleeding, around 6 to 7 days after surgery. This is usually while you are still in hospital and would show as blood in your stool or vomiting blood, which may look like 'coffee grounds'. This bleeding is usually treated using either tiny metal coils or foam to stop.

What are the long-term consequences of the operation?

Malabsorption

The pancreas produces enzymes which help digest food. Removal of part of the pancreas decreases production of these enzymes. This can result in poor digestion of food, causing loose stools which are greasy and pale.

You will need long-term treatment with pancreatic enzyme capsules and will be prescribed Creon capsules to be taken just before food. The usual dose is one capsule (25,000 units) with snacks and two capsules (50,000 units) with meals. You can vary the dose of enzyme that you take from one day to the next, depending on your diet. Foods that contain a large amount of fat will need more Creon. The dose of Creon can be increased if your stools remain loose and greasy.

The enzyme is sourced from porcine (pork) products. Unfortunately there is currently no alternative to this, so please discuss this with the dietitian or doctor if you have any concerns.

You will meet a dietitian on the ward, who will advise you on how to take the Creon capsules. Please see our information booklet "*A guide to eating and pancreatic enzyme supplements*" for more details.

Loss of weight

It is normal to lose weight both before and after surgery. We would expect you to start regaining some of the lost weight 2 to 3 months after surgery.

Alteration in diet

Though there are no specific restrictions to what you can eat, you may find your physical ability to eat is restricted. You may need to have small meals and snack between meals to minimise symptoms of bloating or discomfort. It will take several months for your ability to eat to return to normal.

Diabetes

The pancreas produces insulin, which controls blood glucose. If you were not diabetic before your surgery, you are unlikely to develop diabetes after having half your pancreas removed. If you are already diabetic before your surgery, you are likely to need additional diabetic medication or insulin after surgery. Your blood glucose will be monitored very closely before you go home.

Hernia

It is possible to develop a type of hernia called an incisional hernia after abdominal surgery. This is because of a weakness being created in the wall of the abdominal muscles, allowing a section of bowel to bulge through. This can usually be treated with an abdominal support bandage, but occasionally surgery may be required.

How do I prepare for surgery?

If you smoke, try to stop as soon as possible, to reduce the risk of any breathing problems during and after the operation. We will give you advice before surgery to help you prepare physically for the operation and optimise your level of fitness.

You will also need to plan for any additional help you may need at home whilst recovering, particularly if you live alone. Please let us know about this in advance and we will do what we can to support you.

You will be asked to come to the pre-assessment clinic at the Churchill Hospital before the operation. Please bring a list of your medication with you to the hospital.

During this appointment our team will give you further instructions and explain what you can expect during your admission to hospital.

What happens after the operation?

After spending some time in the anaesthetic recovery area of the operating suite, you will be taken to either the ICU or CORU (recovery ward). If you are spending the first night on CORU you will usually be transferred back to the ward the next day. The nursing staff will monitor your progress and give you painkillers.

You will be on intravenous drips to give you fluids and certain drugs and you will not be allowed to eat full meals for the first few days. After 2 days you should be able to try some soft foods.

You will have a urine catheter in your bladder, a tube in your nose going to your stomach, and a tube coming from your abdomen (abdominal drain). After 3 to 5 days these tubes are usually removed, if we are confident you are making a good recovery and there is no evidence of internal leakage.

It is important that we help you get out of bed and move about as soon as possible. Our physiotherapist will assist you with breathing exercises, which are important in order to prevent a chest infection.

How long will I be in hospital after the operation?

You are likely to be able to go home 5 to 10 days after the operation, if there have been no complications.

The ward nurses will give you painkillers to take at home as needed, and a follow-up appointment will be made for you in the surgical outpatient clinic.

You will also be prescribed a course of injections to take home with you to take for once a day for a month, to thin your blood and reduce the risk of blood clots forming in your leg veins. We will show you how to do this before you go home.

When can I return to normal activities?

On your return home, you will find movements and activity difficult for the first few weeks. You may also feel low in mood, but this will soon get better.

It is important to keep as active as possible, but also to rest. You will need 2 to 3 months to return to normal activities. There are usually no restrictions on activities after that time, but please do discuss with us if you feel a particular problem is not settling.

Will I need any further treatment to follow up?

In some cases, the survival rate for people with pancreatic cancer can be improved by having chemotherapy. We will discuss the option of having chemotherapy with you and we will usually refer you to the oncologist, a cancer chemotherapy specialist, at your local hospital.

You are likely to need monitoring for a few years to check for any recurrence of cancer. This will be arranged with your local oncologist, with follow up scans arranged locally so that you do not have to travel to Oxford unless necessary. We will continue to share in your follow up and arrange to see you if there are any surgical issues that need our opinion. Our specialist nursing and dietitian team will also be available to you for advice.

When should I call my doctor after surgery?

Call your doctor if you:

- develop a fever (high temperature)
- notice your scar has become red and painful, or has a smelly discharge
- develop an unusual degree of pain
- develop nausea, vomiting or diarrhoea, or cannot eat properly.

Useful information

Macmillan Cancer Support

Website: www.macmillan.org.uk

Telephone: **0808 808 0000**

Pancreatic Cancer UK

Website: www.pancreaticcancer.org.uk

Telephone: **0800 801 0707**

Maggie's Oxford (Churchill Hospital, Oxford)

Website: www.maggies.org

Telephone: **01865 751 882**

Useful contact numbers

Hospital Switchboard: **0300 304 7777**

HPB (Hepatobiliary and Pancreatic) Unit Secretary: .. **01865 235 668**

Specialist Cancer Nurses or Specialist dietitian: **01865 235 130**
or call the Hospital Switchboard and ask for **bleep 1386/1891**

Pre-assessment clinic – Churchill Hospital: **01865 226 982**

Churchill Overnight Recovery Unit (CORU): **01865 235 127**

Oxford Upper GI Ward – Churchill Hospital: **01865 235 061**

Intensive Care Unit (ICU) – Churchill Hospital: **01865 235 084**

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.

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