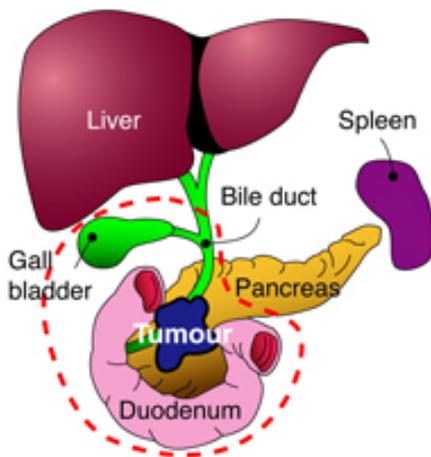


Having an operation on the pancreas

Let us assume you (the reader) are going to have a pancreatic resection. This leaflet attempts to answer some of the questions you may have in mind. We can start with the names of the operations.

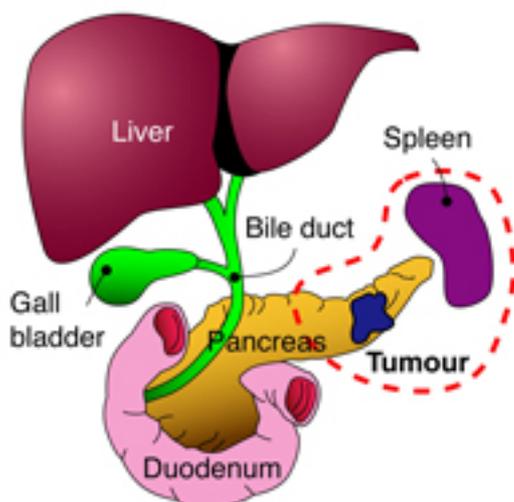
Whipple's operation

This is also known as a **pancreato-duodenectomy** (a variation on this is called **pylorus-preserving pancreato-duodenectomy**)



The head of the pancreas lies next to a part of your bowel called the duodenum. Also running within the head is a part of the bile duct (the tube that carries bile from the liver to the gut). So if you have a tumour in the head of the pancreas, and the head needs to be removed, it is usually removed along with the duodenum, and that part of the bile duct. Often, the gall bladder is removed as well. Once these have

been removed, the surgeon rejoins bowel to bowel (so that food can go down), pancreas to bowel (so that pancreatic juice can flow into the bowel), and bile duct to bowel (so that bile can flow into the bowel). If a **pylorus-preserving pancreato-duodenectomy** (a form of the **Whipple operation**) is performed to remove a tumour in the head of the pancreas, the dotted red line in the adjacent diagram encircles the organs that are removed.



Distal pancreatectomy

Sometimes, the problem may lie in the body or tail of the pancreas, which need to be removed. The spleen lies close to the tail of the pancreas and often has to be removed during this operation. If a distal pancreatectomy and splenectomy is performed to remove a tumour in the tail of the

pancreas, the dotted red line in the adjacent diagram encircles the organs that are removed.

Total pancreatectomy, Central pancreatectomy and Enucleation

Very rarely, it may be necessary to remove the entire pancreas (i.e. **total pancreatectomy**). This is possible, and generally involves removal of the duodenum and the spleen as well. The absence of a pancreas means that no insulin is produced, nor any pancreatic juice. This means you will be diabetic after the operation and require insulin injections. You will also require a pancreatic enzyme supplement pill with each meal. To get around the problem of diabetes, sometimes islet cells (the ones that produce hormones) can be harvested from the pancreas after its removal and injected back into the body. Such **islet cell transplantation** is only done in rare situations, and in a few centres. You may come across some other terms in relation to pancreatic tumours. One is **enucleation**. This refers to the cutting out of a small tumour from the pancreas while leaving the rest of the gland intact. The other is **central pancreatectomy**. This involves removing a central segment (neck or body) of the pancreas and joining the tail to the bowel so it can still discharge its juice into the bowel.

Puestow's operation

The digestive juice that the pancreas makes flows through a little tube inside the pancreas that empties into the bowel. This is called the pancreatic duct. If this tube is blocked, the surgeon may need to cut open the pancreas, expose the tube, and create a new join between the tube and the bowel. This is called a lateral **pancreato-jejunostomy** (i.e. a side-to-side join between the pancreas and the jejunum). It is also referred to as **Puestow's operation**, and there is a variation called **Frey's operation**.

What do these operations involve?

Let us break that up into what happens before, during, and after the operation.

Before the operation

Before admission you will have already had different tests and scans. You will have a discussion about your operation with a

member of the surgical team, after which you will be asked to sign a formal consent to the operation going ahead. Once you are admitted for surgery, you may have some more tests, usually to confirm that you are well enough for an anaesthetic. These include blood tests, an ECG, sometimes a chest x-ray and tests of your lung function. At some point before your operation the anaesthetist will come and see you. It is important that you ask the nurses and the doctors any questions that you may have. The doctors will have to decide whether you will need a bed on the intensive care unit (or the high dependency unit) for your recovery immediately after the operation. Be warned that the availability of such a bed can only be confirmed on the morning of the operation.

You can usually have a normal supper the night before your operation. The last time you may eat (or drink anything other than water) is six hours before your operation, and the last time you may drink water is up to two hours before the operation. You are likely to have a drip going into your veins and, if you are diabetic, you will be put on a regularly monitored and adjusted dose of insulin (called a "sliding scale"). When it is time for your operation you will have to put on some stockings (which reduce the risk of blood clots forming in your leg veins), change into a theatre gown, remove any jewellery, dentures and glasses, and then go to the operating theatre.

In the anaesthetic room, you may first receive an epidural. This involves placing a very thin plastic tube into your back, near the spinal cord, and then inserting a drip containing medication that will reduce your pain after the operation. You will have an opportunity to discuss the pro's and con's of this with the anaesthetist beforehand. If you do not have an epidural, there are other good ways of controlling pain as well. The most common is called PCA or patient-controlled analgesia where you can give yourself a dose of pain-relief through a drip in your arm when you feel pain. After the epidural, you will be given an injection that will make you go off to sleep. The anaesthetist will then place a breathing tube in your airway, place drips into your arm veins, and into a large vein in the neck, and also place a very fine needle into one of your arteries. You will have a catheter to drain your urine, and a tube into your nose draining your stomach. Then the actual operation will start.

The operation itself

A fairly large cut (or incision) will be made in your upper abdomen. The surgeon will assess that it is safe to remove the tumour, cut away the part that is to be removed, and then reconstruct the anatomy, creating joins as required. Once the procedure is finished and all bleeding has been controlled, the wound will be stitched up. Every patient is unique and every operation is different, so it is difficult to predict how long your operation will take. But operations on the pancreas are usually major and complex procedures, and can take several hours. A blood transfusion may or may not be necessary. If you have specific concerns about or objections to blood transfusion, you should discuss that with your surgeon.

After the operation

When you wake up, you may find yourself in the intensive care or high dependency unit, or you may be back in the ward. There will be an oxygen mask on your face. As well as the drips going into your forearms and your neck the tube in your nose and the urinary catheter, there will be one or two plastic tubes (drains) emerging from your abdomen, which will remove any unwanted ooze. You will probably feel some pain and sickness, but you will be given medicines for this.

Over the next few days, the various tubes will be removed one by one. You should be out of bed within one to two days, and be able to walk around the ward in another two to three days. If all goes to plan, you should start sipping fluids in two to three days, and start eating in four to five days. Skin stitches (or clips) come out around day seven to 10, but surgeons often use dissolving stitches these days. If you have an uncomplicated recovery, you can expect to be out of hospital within two weeks of the operation. You will however require a further period of recuperation at home, and it may be anything from two to three months before you get back to your normal activities. If your work involves heavy physical exertion, it may take longer.

How will my body cope if you take away a part of my pancreas?

It is difficult to predict exactly what will happen in your individual case. As you know, the pancreas makes digestive enzymes. You

may find that you are short of these enzymes. This usually results in loose and frequent bowel movements, and is easily rectified by taking enzyme tablets with each meal. If you are already on such tablets, you may find that you need a higher dose. The other thing the pancreas does is produce insulin and control your blood sugar. Removal of part of the pancreas may therefore make your blood sugar levels go up and make you diabetic. You will then need insulin injections on a regular basis, and have to avoid sugary and fatty foods. If you already are diabetic, then your insulin or tablet dosage will probably need to be increased. If you have your entire pancreas removed (i.e. a total pancreatectomy) then both these things (insulin-dependent diabetes and the need for enzyme supplements) will apply to you.

What are the possible complications?

Every operation carries some risks, and so will yours.

A general anaesthetic carries some risk, and there is a small chance that you may develop problems relating to your heart or your breathing. If you already have heart disease or lung disease, this risk is increased. The various lines (needles) and catheters that are put in may cause some bleeding or local injury or may introduce infection. They are, however, put in with great care and with sterile precautions. If you wish to receive more information on this, do ask your anaesthetist.

Bleeding during or after the operation may happen after any surgery. Blood will be cross-matched and kept available should you need a transfusion. Transfusion itself carries some risks (reactions from a mis-match, transmission of viruses) and is not given except when absolutely necessary.

Infection is another possible complication, and can involve the wound, or the inner organs. You will receive antibiotics around the time of surgery to try and prevent this from happening. A join between two tubes (or "anastomosis") that the surgeon creates can sometimes leak, and if that happens, it may need the placement of further drains (to drain the leaking fluid to the outside), or even another operation.

The pain from your wound will make coughing difficult. Patients

sometimes develop chest infection from retained phlegm. Deep breathing, clearing out the phlegm in your throat and chest and working with the physiotherapist is very important.

Lying still in bed can lead to the formation of clots in the legs (called deep vein thrombosis or DVT) and these can sometimes float off in the circulation and reach the lungs (called pulmonary embolism or PE). These are serious complications, and doctors try hard to prevent them. You will be asked to wear elastic stockings, and will receive a mild dose of an anti-coagulant to reduce the risk of clot formation. You can help by moving your legs in bed, and getting out of bed as soon as your condition will allow after the operation.

The spleen helps you fight certain kinds of infection. If your doctor thinks your spleen will have to be removed, he/she will give you vaccines before the operation to reduce the risk of infections. If your spleen is removed you will need to take an antibiotic tablet (usually penicillin or amoxicillin) regularly for the rest of your life. You will also need to be vigilant and report all infections and fevers promptly to your family doctor. Occasionally, not having a spleen makes your platelet count go up (platelets are a type of blood cell), and if that happens, you may need to take a tablet of Aspirin daily.

This is NOT a complete list of everything that can possibly go wrong, but a general discussion of the risks of pancreatic surgery. If you have specific concerns or wish to receive more information, do ask your doctor.

What are my chances of surviving the operation?

Information collected from hospitals all over the world indicates a mortality rate of around 5-6% from major pancreatic surgery. In other words, you would have a 94-95% chance of surviving your operation.

Will I be cured?

If the operation is to remove a cancer, that question is difficult to answer immediately. Pancreatic resections for cancer are usually carried out with the intent to cure. But there will undoubtedly be a significant risk of the tumour coming back, and only time will tell if you have been cured. The pathologist's report on the parts that are

removed will give you some clues. This report usually takes seven to 10 days to come through, and if it is not ready by the time you leave hospital, your doctor will discuss it with you at your first visit to the outpatient clinic a few weeks after your surgery. He/she will also at that time discuss if any further treatment is required. If you wish to receive more information on this, please ask your surgeon. Sometimes, during your operation, the surgeon may find that the cancer is more advanced than the scans suggested, or that it cannot be safely removed. In such situations, the aim will be to do everything possible to relieve your current symptoms and prevent future problems. Often this involves the creation of a join between the bile duct and the bowel (to relieve or prevent jaundice), and a join between the stomach and the bowel (to relieve or prevent a blockage in the duodenum). These are often referred to as bypass procedures.

Your operation may be carried out not for cancer but to relieve symptoms caused by benign disease or chronic inflammation. Jaundice is usually relieved quite successfully. In the case of chronic pain, it is difficult to predict how successful the operation will be in relieving pain. You would have to wait and see.

A final word of caution: The treatment options are described here in a very general sense, and you should discuss your treatment with your own doctors and nurses.