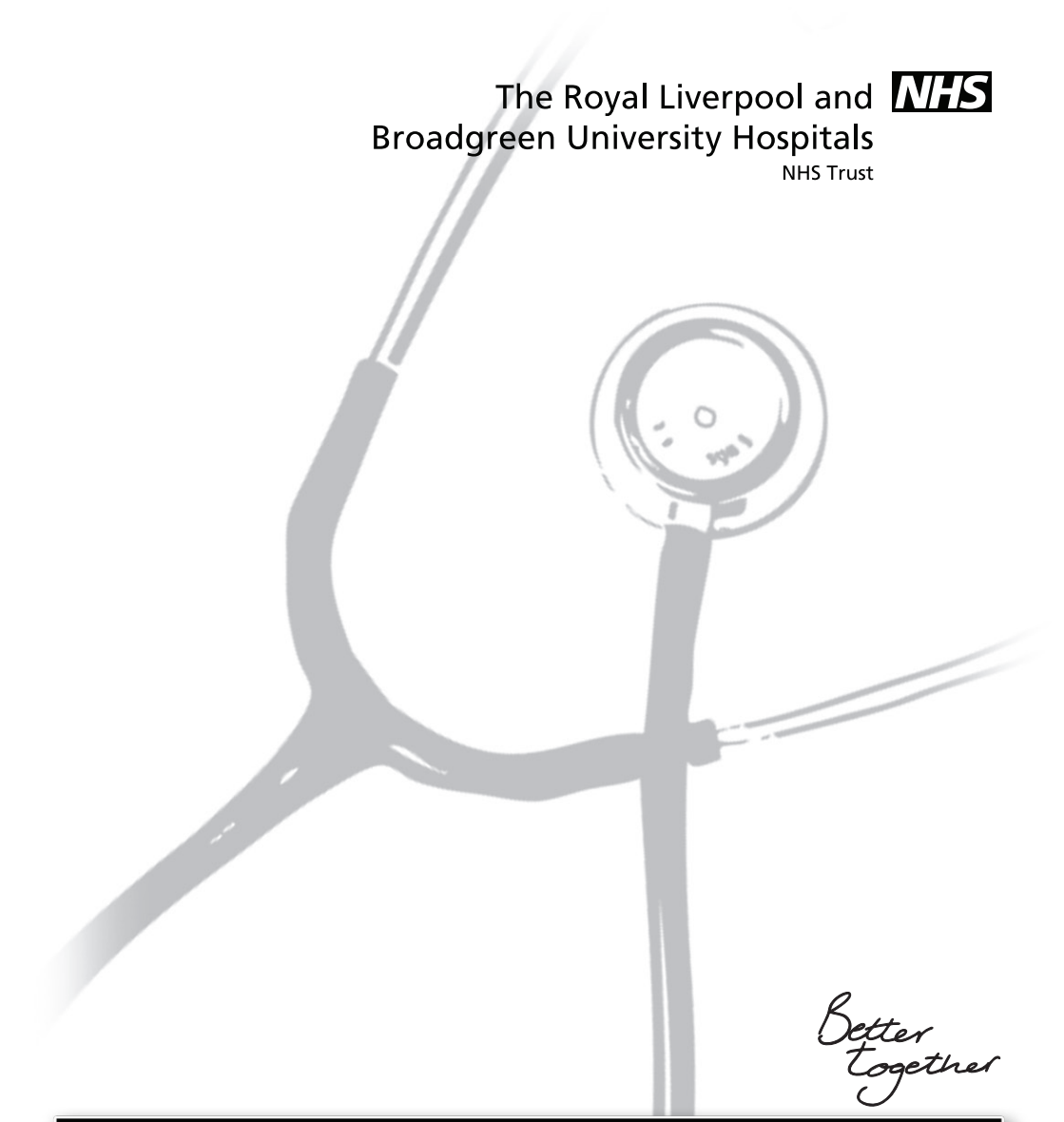
The Royal Liverpool and Broadgreen University Hospitals NHS Trust



Better together

Patient Information

Pancreatic Necrosis

Directorate of Surgery
Hepato-Pancreato Biliary (HPB) Surgical Team

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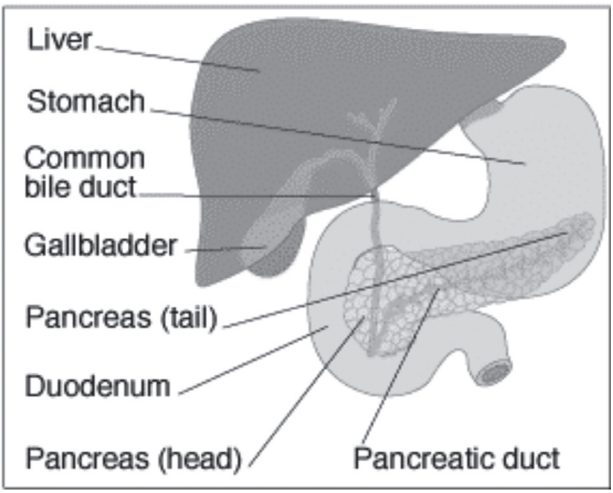
The Pancreas Gland

The pancreas is a solid gland measuring 25-29 centimetres in length, four to six centimetres in width and three to four centimetres in depth. The head of the gland is situated just to the right of the midline of your abdomen and below your right ribcage. It is closely attached to the duodenum, which is the first part of the small bowel into which your stomach empties liquid and partially digested food.



What does it do?

Digestion

Digestion of food, which consists of carbohydrates, proteins and fats, is not possible without the pancreas. The pancreas produces enzymes, which are passed into the duodenum along the pancreatic duct; these are responsible for breaking down food into particles ready for absorption. The digestion of fat is very special; the pancreatic enzymes cannot digest the fat unless it has been prepared first. Bile acids made in the liver and stored in the gall bladder work on the fat first to get them ready for the pancreatic enzymes to help digest them. The bile is passed down the bile duct and into the duodenum; therefore both pancreatic juice and bile are needed for efficient digestion and absorption.

Insulin and Glucose Metabolism

All the cells of the body use glucose as a source of energy. The pancreas is the organ responsible for the production of a hormone called insulin. Insulin regulates the levels of glucose in our bloodstream, too much or too little glucose can be very dangerous. If part of the pancreas is removed or damaged there is usually enough pancreas left to prevent sugar diabetes forming, but sometimes diabetes will develop.

What is Acute Pancreatitis?

This is an inflammation of the pancreas. It develops very suddenly and, in the majority of patients (about 75%) improves steadily with good hospital treatment over the course of a week or so. A blood sample usually shows the presence of a large amount of amylase (a pancreatic enzyme) in the blood.

We do not know why about 25% of patients develop an attack of severe acute pancreatitis. Once this occurs, then the chances of complications and death are high. Because we still do not understand all the factors responsible for causing the various complications, treatment is sometimes not successful and patients can unfortunately die. For these reasons, it is important patients with severe pancreatitis are looked after by specialists if this is at all possible. Severe pancreatitis places a stress on all the main organs of the body: the heart, lungs, kidneys, other gut organs, the brain and the peripheral vasculature (the blood vessels that nourish all the organs). Patients who are elderly are less capable of coping with these stresses. Equally, for reasons we do not understand, some young people also cannot cope with the stresses and death will occur despite every effort on the part of those caring for them.

Causes of Acute Pancreatitis

The two major causes of acute pancreatitis are either gallstones or alcohol. The Department of Health recommends an alcohol daily limit of two to three units for women and three to four units for men.

Rare causes include hyperlipidaemia (excessive level of lipids in blood), mumps, pregnancy, hereditary (genetic) and idiopathic (cause not known).

Pancreatic Necrosis

In some cases there may be severe death of the tissue (necrosis) of the pancreas or tissues surrounding the pancreas. One or more CT or MRI scans will be necessary to assess the state of the pancreas. It is common to see one or more acute fluid collections in the abdomen. These are usually quite harmless and disappear without specific treatment.

Only the CT or MRI can reliably show whether there is pancreatic necrosis (or gangrene of the pancreas). This usually does not fully appear until a week or so after the start of the illness. If there is necrosis it is important to know whether this is infected (called infected pancreatic necrosis) or not infected (called sterile pancreatic necrosis).

Infected pancreatic necrosis is similar to wet gangrene (and needs urgent removal) and sterile pancreatic necrosis is similar to dry gangrene (and usually improves without specific removal). It is not usually possible to tell from the CT or MRI whether the pancreatic necrosis is infected or not.

The best way to do this is by inserting a needle into the dead pancreas and removing some tissue for inspection for bacteria and fungi. A very fine needle is passed into the pancreas using CT and the dead tissue sucked up (or aspirated) into a syringe.

The procedure is therefore done in the X-ray department. The samples are examined under the microscope but it is usually difficult to see the bacteria and /or fungi. Therefore these are also cultured in the microbiology department. This means that the results may not be available for 24 hours or so. For these reasons this procedure is known as fine needle aspiration for bacteriology and fungi, or FNA.

Most patients with extensive pancreatic necrosis will have FNA performed at least once. Before the doctors are sure whether there is infection or not. If the necrosis is extensive or if there is evidence of infection of the necrosis, then surgery will be needed.

The timing of the surgery and the extent of surgery are difficult decisions to make even for experienced pancreatic surgeons. Once it is decided to operate for severe necrosis, the likelihood of success is anywhere between 20% and 80%, but this depends very much on individual cases. The procedure used for removing extensive pancreatic dead tissue (necrosis) is called a 'necrosectomy'.

Investigations

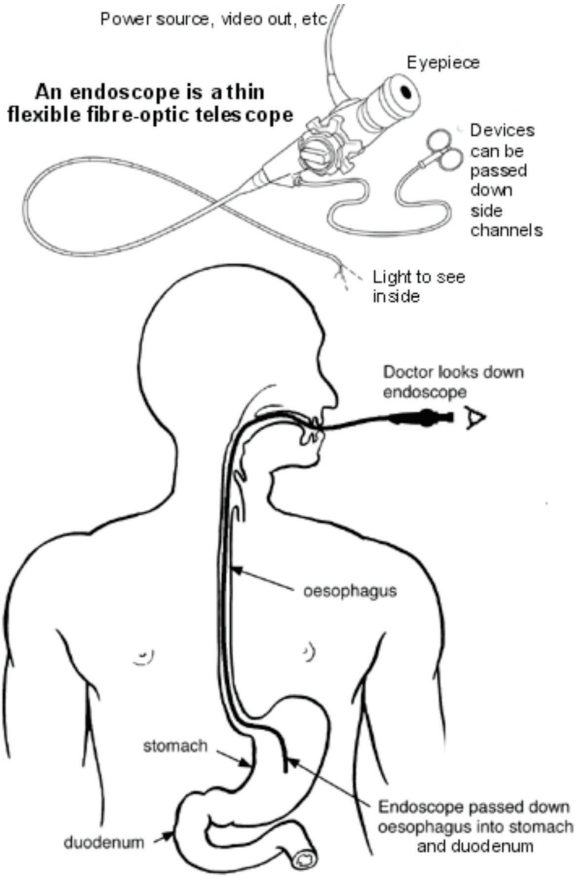
While in hospital your doctor may ask for some of the following investigations:

Ultrasound
An ultrasound takes place in the X-ray department. A scanning device with jelly on is passed over your abdomen and pictures are obtained on a screen. Information about the pancreas, liver, gall bladder and bile ducts can be obtained.

CT Scan (Computed Tomography Scan)
A CT scan is another type of X-ray that gives more in-depth pictures of the abdomen and involves you lying on a bed that moves in and out of the scanner that is shaped like a large polo mint, while pictures are taken. Special liquids are often used to allow particular areas of the body to be seen more clearly on the scan. You may be asked to drink some liquid or it may be given as an injection.

Endoscopic retrograde cholangio-pancreatography (ERCP)
This test is performed under sedation. A small flexible tube called an endoscope is passed through your mouth and stomach, and out into the biliary tract. A special dye is injected which shows the common bile duct and pancreatic duct.

If stones are present they may be removed. If there is a stricture causing obstruction to the flow of bile then a stent (narrow tube) can be pushed down the inside of the blocked duct to hold it open. This is a temporary measure until jaundice settles and any surgery needed can be carried out. Sometimes the stents are left in permanently if surgery is considered unlikely. During the procedure pictures are taken and the doctor carrying out the examination writes a written report on his findings afterwards



Endoscopic Ultrasound (EUS)

This is a very similar procedure to an ERCP and involves an ultrasound probe being passed down the endoscope to take an ultrasound scan of your pancreas and surrounding organs.

Fine Needle Aspiration (FNA)
Occasionally a small piece of tissue from the pancreas is needed to help make a diagnosis. This involves a fine needle being passed through the skin into the pancreas and a sample taken. CT scan or ultrasound scan is used as a guide to ensure the sample is taken from the correct place.

Magnetic Resonance Imaging (MRI)
An MRI scan is similar to a CT scan but uses magnetic fields to image the pancreas instead of X-rays. Very powerful magnets are used to generate the pictures. MRI scans can be used to provide good pictures of the bile and pancreatic ducts and is called MRCP.

Treatment

Minimally invasive necrosectomy
It may be possible to remove dead pancreatic tissue using "keyhole" surgery this is the preferred treatment method at the Royal Liverpool University Hospital. This is the most common treatment because the survival rate is better compared to open necrosectomy.

This involves inserting a guide wire into the pancreas necrosis using CT in the X-ray Department. The patient is then taken to the operating theatre where a telescope is introduced along the guide wire into the pancreatic necrosis.

The dead tissue is removed. As with open necrosectomy a large tube is left in the middle of the dead pancreas for continuous washout. This procedure is often referred to as 'skunking'. This procedure can often be done using local anaesthetic and mild sedation and usually has to be repeated several times. It is only available in a few specialised centres.

The process of clearing all of the pancreatic necrosis can be very time consuming and may take several months. It is very important you remain patient. In order to discharge patients as soon as possible it is likely the drainage tube will still be present when you go home. A district nurse will see you regularly to help you to flush the drain and empty the bag. You will be seen regularly in outpatients and the tube will slowly be shortened before it is finally removed.

Open necrosectomy
This requires a large operation to remove dead pancreatic tissue and a general anaesthetic is required. For several weeks even months tubes are left behind for continuous wash out of small pieces of dead tissue (lavage). More than one operation may be necessary.

Discharge home

What can I eat?

For a few weeks after an attack of acute pancreatitis you should eat at regular intervals. It is usually better to take four or five snacks a day than a full meal. If you have gallstones, and for some reason your gall bladder has not been removed, avoid fatty foods such as butter, eggs, fried foods, sausages and bacon.

Following removal of your gall bladder you are free to eat anything you wish. You will have a very healthy appetite and you may put on more weight than you would otherwise, unless care is taken to avoid excess calories. If you have had extensive pancreatic necrosis it is likely you will need pancreas enzyme supplements (see below) and even insulin if you have developed sugar diabetes (see below).

Can I drink alcohol?

Alcohol is not recommended for patients who have recurrent acute pancreatitis and should be avoided in patients for whom the cause of their acute pancreatitis is alcohol.

Pancreatic Enzyme Supplements

There are many preparations available. These preparations differ considerably in their effectiveness of action. The most common is a medication called Creon which consists of capsules containing scores of small granules. The capsules need to be taken during each meal and with any snack and help the body to breakdown fat and protein from your food. The requirements vary greatly from patient to patient and your dose may need to be altered once you are eating properly.

Insulin

If you are diagnosed with diabetes you will be seen by the Diabetes Team who will decide the best treatment for you. This may mean simply watching what you eat or taking tablets or injections. The regime needed and the dose used will be adjusted on an individual basis until the doctor can find the combination that suits you best.

Further Information

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Support Groups

Pancreatitis Supporters Network www.pancreatitis.org.uk

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The above information is available on request in alternative formats including other languages, easy read, large print, audio, Braille, Moon and electronically.