

Pancreatic Cancer

What is the pancreas?

The pancreas is a gland and a key organ in the digestive system. It is located in the back of the abdomen behind the stomach and in front of the spine. The pancreas has two main functions: to release enzymes that aid in digestion and to help regulate blood sugar.

The pancreas is located at a “crossroads” where a tube from the liver (called the bile duct) crosses through it and connects with the main tube that contains the pancreatic enzymes (called the pancreatic duct). Its location and close relationship with the first portion of the intestine (called the duodenum) makes operations more challenging.

The pancreas has the shape of an elongated fish and is divided in three parts. The widest parts (that contains the “crossroads” mentioned above is called the head of the pancreas. The central part of the pancreas is called the neck or body. The thin end of the pancreas that extends to the left side of the abdomen is called the tail.

What is pancreatic cancer?

The term “pancreatic cancer” refers to pancreatic ductal adenocarcinoma which is the most common type of pancreatic cancer, representing about 94% of all pancreatic tumors. This is the type of tumor that is discussed in this handout.

What are the risk factors?

Genetically inherited factors (related to family history of cancer); About 10% of cases are thought to have a hereditary or familial component

Most pancreatic cancers are sporadic, which means they are a result of “bad luck” and environmental factors.

Other known environmental risk factors are:

- Cigarette smoking
- Alcohol use
- Chronic inflammation of the pancreas (“chronic pancreatitis”, which is often related with chronic alcohol use or complications related with gallstone disease)
- Diabetes (elevated blood sugar)
- Obesity
- Some types of pancreatic cysts are associated with an increased risk of pancreatic cancer and should be followed by your physician

What are the symptoms?

About 60-70% of pancreatic cancers begin in the head of the pancreas. Cancers that start in the head of the pancreas are near the common bile duct. These cancers can press on the duct and cause yellow discoloration of your skin and eyes (called jaundice), loss of appetite, weight loss, mild abdominal discomfort/pain especially to the upper part of the abdomen. Sometimes, patients develop a change of color to the stool (they become lighter, like clay) and also of their urine that becomes much darker (like coca-cola).

How is pancreatic cancer diagnosed?

Many pancreatic cancers are diagnosed by chance, meaning imaging is done for another reason and a mass in the pancreas is seen. Another common way is when patients present with jaundice (yellowness of the eyes and skin), weight loss, loss of appetite as mentioned above. Your doctor will typically order blood tests to confirm the elevation in the bilirubin (the pigment that causes that discoloration) and imaging tests to check for a mass in or around the pancreas. Once that is confirmed, you will be referred to a gastroenterology doctor who will perform an additional test that is called endoscopic retrograde cholangiopancreatography (ERCP) and/or Endoscopic ultrasound (EUS).

Additional testing may include:

- **Endoscopic retrograde cholangiopancreatography (ERCP):** For this test, an endoscope (a thin, flexible tube with a tiny video camera on the end) is passed down the throat, through the esophagus and stomach, and into the first part of the small intestine. This is usually done while you are sedated (given medicine to make you sleepy). During the ERCP, a stent may be placed into the bile duct to relieve an obstruction caused by a tumor.
- **Endoscopic ultrasound (EUS):** This exam uses soundwaves to create detailed images of the pancreas. An endoscope is also used for this test and is inserted into the body near the pancreas. A sample of tissue (biopsy) that can help with a diagnosis may be taken during this test.

What is staging?

Pancreatic cancer is hard to find early. The pancreas is deep inside the body, so early tumors are not often seen or felt by health care providers during routine physical exams. Staging refers to the testing that is done to determine tumor size and location, whether it has spread to other places in the body and whether it is able to be surgically removed. Staging helps to plan the appropriate treatment.

Pancreatic Cancer Staging usually consists of a computed tomography scan (CT scan) with intravenous contrast and laboratory tests including blood samples and a tumor marker test. The four stages of pancreatic cancer are Stage I, II, III and IV. Stage I is an early pancreatic cancer, with stage IV being the most advanced stage when the cancer has spread to other parts of

the body. Metastasis refers to when the cancer has spread to another part of the body either by traveling through the lymph system or the blood.

What is a tumor marker?

Tumor markers are substances released by cancer and non-cancerous cells in the body. They are produced at much higher levels in cancerous conditions. CA19-9 is the most commonly used tumor marker in pancreatic cancer. CA19-9 antigens are foreign substances released by pancreatic tumor cells. Not everyone with pancreatic cancer will have a high CA19-9 and sometimes non-cancerous conditions can cause CA19-9 levels to increase. Your doctor will order a blood test to check your CA19-9 level.

How is pancreatic cancer treated?

Treatment for pancreatic cancer depends upon the size, location and extent of the tumor as well as the patient's general health and nutritional condition. The main types of treatment are explained below. Because of the propensity of pancreatic cancer to spread to other organs (called metastases), chemotherapy (systemic therapy) is used in all stages of pancreatic cancer. Surgery remains the only potentially curative modality for pancreatic cancer and the sequence of chemotherapy and surgery are determined on a case-by-case basis at a multidisciplinary meeting (called tumor board).

- **Surgery** - If imaging tests show a reasonable chance of removing the cancer completely, surgery is the preferred treatment if possible. Surgery offers the only realistic chance for cure. The type of surgery a patient has depends on the tumor location within the pancreas. Sometimes a **laparoscopy** is done before surgery to make sure that the cancer has not spread. Additionally, some patients may develop an intestinal blockage caused by the tumor. Surgery can be done to bypass the blockage or your doctor may decide to place a stent (tube) in the first part of the small intestine to open the blocked area. Patients will get only one procedure, **not** bypass surgery and a stent.

There are three types of surgery that are used to remove pancreas tumors:

- **Whipple procedure** – most common surgery used to remove tumors in the head of the pancreas
 - **Distal pancreatectomy** – surgery that removes tumors in the body and tail of the pancreas
 - **Total pancreatectomy** – complete removal of the pancreas
- **Radiation Treatment** - Radiation treatment uses high-energy x-rays to kill cancer cells. Radiation may be given before or after surgery. It may also be given to help relieve certain symptoms.
 - **Chemotherapy** - Chemotherapy is treatment for cancer using specific cancer fighting drugs. They are used to kill rapidly dividing cells including cancer cells. Patients usually receive chemotherapy through an IV (into a vein) or orally (by mouth). Chemotherapy drugs are able to flow through the bloodstream to nearly every part of the body. They are

given in cycles and the length of each cycle depends on the specific drug being given. Most chemotherapy for pancreatic cancer can be given in an outpatient setting. Chemotherapy side effects depend on the drugs and doses being given.

Common side effects include:

- Fatigue
- Loss of appetite
- Nausea
- Vomiting
- Hair loss.

Patients may receive chemotherapy before or after surgery or it may be given to help relieve certain side effects. Chemotherapy may also be used in combination with radiation (called chemoradiation therapy) to enhance the effect of radiation.

- **Targeted Therapy** - Targeted therapies are drugs that interfere with the growth of cancer cells while causing less harm to normal cells. They may be given in combination with chemotherapy or as part of a clinical trial.
- **Clinical Trials** - Clinical trials are research studies used to help identify new anti-cancer treatments. Not all clinical trials are right for all patients. A trial may be safe for one patient to join but not safe for another. Each trial has strict rules that doctors must follow. These rules protect patients from receiving treatment that may cause harm. These rules are called eligibility criteria. Talk to your doctor about whether there is a clinical trial you may qualify for.

What kind of follow-up care should I expect?

Follow-up care after treatment is important to check for any changes. If the cancer returns or spreads or if a new cancer develops, it can be treated as soon as possible. Follow-up visits may include physical exams, CT scans or lab tests. It is important to tell your doctor or nurse about any health problems as soon as they occur.

Resources

American Society of Clinical Oncology
www.cancer.net/pancreatic

Pancreatic Cancer Action Network
www.pancan.org

Pancreatic Cancer Action Network (PanCAN) is a charity that funds research, provides patient support and conducts community outreach to advance the treatment of pancreatic cancer.