



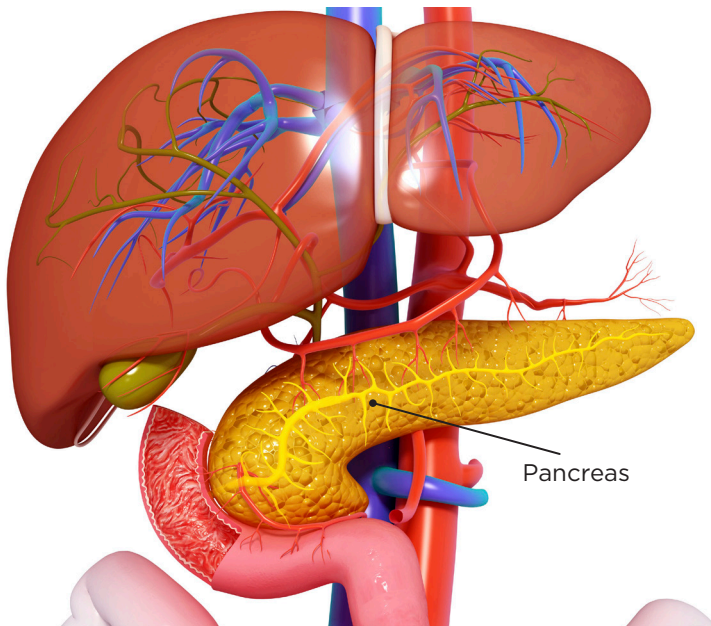
# **Pancreatic Cancer**

**SANFORD**  
CANCER CENTER



# Overview

Cancer of the pancreas is a disease in which malignant (cancer) cells form in the tissues of the pancreas.



The pancreas is a gland about 6 inches long that is shaped like a thin pear lying on its side. The wider end of the pancreas is called the head, the middle section is called the body, and the narrow end is called the tail. The pancreas lies between the stomach and the spine.

The pancreas has two main jobs in the body:

- To make juices that help digest (break down) food.
- To make hormones, such as insulin and glucagon, that help control blood sugar levels. Both of these hormones help the body use and store the energy it gets from food.

The digestive juices are made by exocrine pancreas cells and the hormones are made by endocrine pancreas cells. Most pancreatic cancers begin in exocrine cells. The most common types are adenocarcinomas (add-en-oh-car-sin-oh-mas).

# Risk Factors

Anything that increases your chance of getting a disease is called a risk factor. Having a risk factor does not mean that you will get cancer. Risk factors for pancreatic cancer include personal and family health history, lifestyle choices, as well as other things.

Risk factors for pancreatic cancer include the following:

- Smoking
- Being overweight or obese
- Having a personal history of diabetes or chronic pancreatitis
- Having a family history of pancreatic cancer or pancreatitis
- Having certain hereditary conditions, such as:
  - Hereditary nonpolyposis colon cancer (HNPCC; Lynch syndrome)
  - Von Hippel-Lindau syndrome
  - Peutz-Jeghers syndrome
  - Hereditary breast and ovarian cancer syndrome
  - Familial atypical multiple mole melanoma (FAMMM) syndrome.

The genes in cells carry the hereditary information received from their parents. Some pancreatic cancers are caused by inherited gene mutations (changes). Hereditary pancreatic cancer makes up about 1 out of 6 of all cases of pancreatic cancer. Many cancers can have a hereditary link to pancreatic cancer. There are tests that can detect gene mutations. Genetic testing can help determine treatment and help family members know of their own risk for the future. All patients with pancreatic cancer should be referred for genetic risk evaluation.

# Screening

Approved screening tests help find a pre-cancer condition or cancer at an early stage. There is no approved screening test for cancer of the pancreas.

# Diagnosis

Pancreatic cancer may not cause early signs or symptoms. Signs and symptoms may be:

- Jaundice (yellowing of the skin and whites of the eyes)
- Light-colored stools
- Dark urine
- Pain in the upper or middle abdomen and back
- Weight loss for no known reason
- Loss of appetite
- Feeling very tired

Pancreatic cancer is hard to find and diagnose early for these reasons:

- No signs or symptoms in the early stages of pancreatic cancer.
- The signs and symptoms of pancreatic cancer, when present, are like the signs and symptoms of many other illnesses.
- The pancreas is hidden behind other organs such as the stomach, small intestine, liver, gallbladder, spleen, and bile ducts.

## Tests to Find, Diagnose, and Monitor Pancreatic Disorders

Not every person needs every test or procedure.

### Physical exam and history.

**Blood chemistry studies:** A blood sample is checked to measure substances such as bilirubin. A higher or lower amount of a substance can be a sign of disease.

**Tumor marker test:** Certain substances made by the body may be linked to cancers when found in increased numbers. These are called tumor markers. Blood, urine, or tissue is checked to measure the amounts of certain substances, such as CA 19-9, and carcinoembryonic antigen (CEA). The numbers do not mean you have or do not have cancer. Not every patient will have a high tumor marker. For this reason, it cannot be used for a screening. These tests may be repeated to see how well your treatment is working.

**MRI (magnetic resonance imaging):** A procedure that uses a magnet, radio waves, and a computer to make a series of detailed pictures of areas inside the body.

**CT scan (computed tomography):** A series of detailed pictures of areas inside the body are taken from different angles. The pictures are made by a computer linked to an x-ray machine. A dye may be given into a vein or swallowed to help the organs or tissues show up more clearly.

**PET scan (positron emission tomography scan):** A small amount of radioactive glucose (sugar) is injected into a vein. The PET scanner rotates around the body and makes a picture of where glucose is being used in the body. Cancer cells show up brighter in the picture because they are more active and take up more glucose than normal cells do.

**Abdominal ultrasound:** An ultrasound exam uses sound waves to make pictures of the inside of the abdomen.

**Endoscopic ultrasound (EUS):** A procedure in which a lighted scope is inserted into the body, usually through the mouth. A probe at the end of the scope is used to bounce sound waves (ultrasound) to see structures near the pancreas.

**Endoscopic retrograde cholangiopancreatography (ERCP):**

A procedure used to x-ray the ducts (tubes) that carry bile from the liver to the gallbladder and from the gallbladder to the small intestine. Sometimes pancreatic cancer causes these ducts to narrow and block or slow the flow of bile, causing jaundice. A lighted scope is passed through the mouth, esophagus, and stomach into the first part of the small intestine. If jaundice is caused by a tumor, a fine tube may be inserted into the duct to unblock it. This tube (or stent) may be left in place to keep the duct open.

**Percutaneous transhepatic cholangiography (PTC):** PTC is a way to x-ray the liver and bile ducts. A thin needle is inserted through the skin below the ribs and into the liver. Dye is injected into the liver or bile ducts and an x-ray is taken. If a blockage is found, a thin, flexible tube called a stent is sometimes left in the liver to drain bile into the small intestine or a collection bag outside the body. This test is done only if ERCP cannot be done.

**Laparoscopy:** A surgery using a lighted scope to look at the organs inside the abdomen to check for signs of disease.

**Biopsy:** The removal of cells or tissues so they can be viewed under a microscope by a pathologist to check for signs of cancer.

## How Cancer Spreads

Cancer may spread from where it began to other parts of the body. After cancer has been diagnosed, tests are done to find out if cancer cells have spread within the area or to other parts of the body.

There are 3 ways that cancer spreads in the body. Cancer can spread through tissue, the lymph system, and the blood:

- **Tissue:** The cancer spreads from where it began by growing into nearby areas.
- **Lymph system:** The cancer spreads from where it began by getting into the lymph system. The cancer travels through the lymph vessels to other parts of the body.
- **Blood:** The cancer spreads from where it began by getting into the blood. The cancer travels through the blood vessels to other parts of the body.

The process used to find out where the cancer is located is called staging. It is important to know the stage in order to plan treatment.

# Staging

## Pancreatic Cancer Staging

- The TNM system is part of staging cancer.
- Pancreatic cancer stages are described as 0 (zero) to IV (4).

## TNM Staging

Your doctor may use these words as part of your pathology report.

**T is for Tumor.** This describes the size and spread of the main tumor.

**N is for Nodes.** This describes if cancer has spread to nearby lymph nodes.

**M is for Metastases.** This explains the location of spread to other organs or to distant lymph nodes.

Part of gathering information about the cancer stage includes if the cancer can be removed by surgery. These are divided into 3 types:

- **Resectable:** The cancer is thought to be able to be removed by surgery.
- **Borderline resectable:** The cancer may have just reached nearby blood vessels. The surgeon may feel the cancer can be removed. Sometimes treatments such as chemotherapy or a combination of chemotherapy and radiation therapy could be given first. There are times this could make the cancer smaller before surgery. This is called neoadjuvant treatment.
- **Unresectable:** These cancers cannot be removed entirely by surgery.
  - Locally advanced: Has not spread to distant organs.
  - Metastatic: Cancer that has spread to distant organs.



## Stage 0 (Zero-Carcinoma in Situ)

In stage 0, abnormal cells are found in the lining of the pancreas. These abnormal cells may become cancer and spread into nearby normal tissue. Stage 0 is also called carcinoma in situ.

## Stage I (one)

In stage I, cancer has formed and is found in the pancreas only.

## Stage II (two)

In stage II, cancer may have spread to nearby tissue and organs, and may have spread to lymph nodes near the pancreas.

## Stage III (three)

In stage III, cancer has spread to the major blood vessels near the pancreas and may have spread to nearby lymph nodes.

## Stage IV (four)

In stage IV, cancer may be of any size and has spread to distant organs, such as the liver, lung, and peritoneal cavity. It may have also spread to organs and tissues near the pancreas or to lymph nodes.

The distant spread of cancer, called the metastatic tumor, is the same type of cancer as the primary tumor. For example, if pancreatic cancer spreads to the liver, the cancer cells in the liver are actually pancreatic cancer cells. The disease is metastatic pancreatic cancer, not liver cancer.

## Recurrent Pancreatic Cancer

Recurrent pancreatic cancer is cancer that comes back after it has been treated. The cancer may come back in the pancreas or in other parts of the body.

# Treatment Option Overview

## Key Points to Learn In This Section

There are different types of treatment depending on the type of cancer. These could include surgery, drug treatment, or radiation therapy.

## Clinical Trials

You can enter clinical trials before, during, or after starting your cancer treatment.

The prognosis (chance of recovery) and treatment options depend on the following:

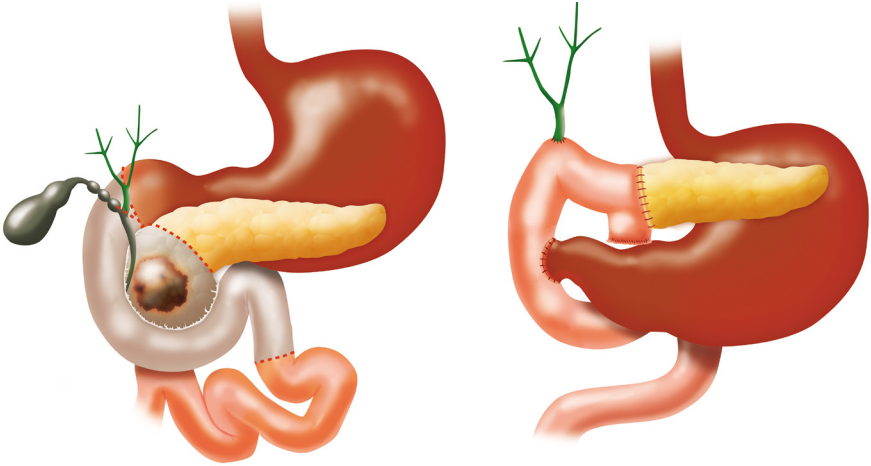
- Whether or not the tumor can be removed by surgery. Pancreatic cancer can be controlled only if it is found before it has spread, when it can be completely removed by surgery.
- The stage of the cancer (the size of the tumor and whether the cancer has spread outside the pancreas to nearby tissues or lymph nodes or to other places in the body)
- Your general health
- Whether the cancer has just been diagnosed or has recurred (come back)

If the cancer has spread, palliative treatment can improve your quality of life by controlling the symptoms and complications of this disease.

## Surgery

One of the following types of surgery may be used to take out the tumor:

- **Whipple procedure:** A surgical procedure in which the head of the pancreas, the gallbladder, part of the stomach, part of the small intestine, and the bile duct are removed. Enough of the pancreas is left to produce digestive juices and insulin.



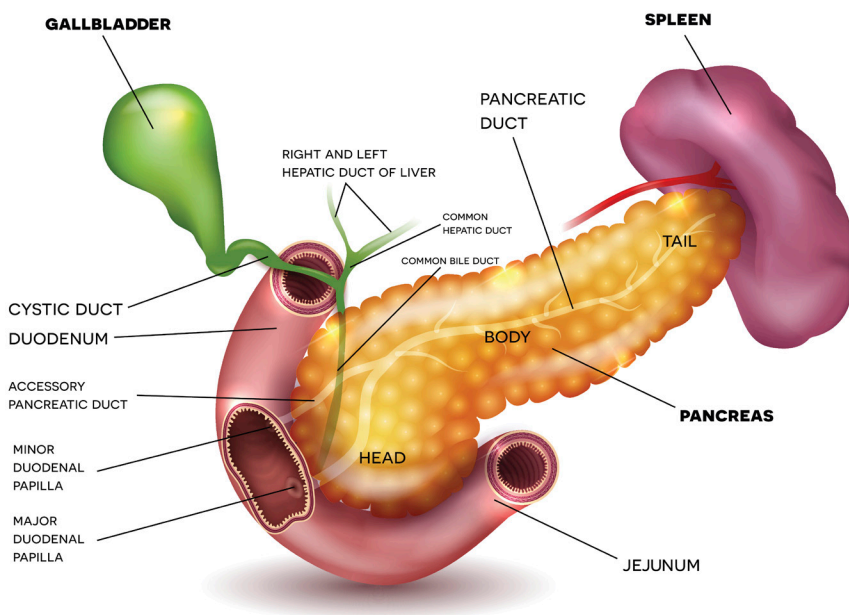
- **Total pancreatectomy:** This operation removes the whole pancreas, part of the stomach, part of the small intestine, the common bile duct, the gallbladder, the spleen, and nearby lymph nodes.
- **Distal pancreatectomy:** The body and the tail of the pancreas and usually the spleen are removed.

If the cancer has spread and cannot be removed, the following types of palliative surgery may be done to relieve symptoms and improve quality of life:

- **Surgical biliary bypass:** If cancer is blocking the small intestine and bile is building up in the gallbladder, a biliary bypass may be done.

- **Endoscopic stent placement:** If the tumor is blocking the bile duct, surgery may be done to put in a stent (a thin tube) to drain bile that has built up in the area. The doctor may place the stent through a catheter that drains to the outside of the body or the stent may go around the blocked area and drain the bile into the small intestine.
- **Gastric bypass:** If the tumor is blocking the flow of food from the stomach, the stomach may be sewn directly to the small intestine so the patient can continue to eat normally.

The image below may be used to learn about your treatment plans.



## Radiation Therapy

Radiation therapy is a cancer treatment that uses high-energy x-rays or other types of radiation to kill cancer cells or keep them from growing. The way the radiation therapy is given depends on the type and stage of the cancer being treated.

## Chemotherapy

Chemotherapy is a cancer treatment that uses drugs to stop the growth of cancer cells, either by killing the cells or by stopping them from dividing. When chemotherapy is taken by mouth or injected into a vein or muscle, the drugs enter the bloodstream and can reach cancer cells throughout the body (systemic chemotherapy).

The way the chemotherapy is given depends on the type and stage of the cancer being treated.

## Chemoradiation Therapy

Chemoradiation therapy combines chemotherapy and radiation therapy to increase the effects of both.

## Targeted Therapy

Targeted therapy is a type of treatment that uses drugs or other substances to identify and attack specific cancer cells without harming normal cells.

## Pain Treatment

Pain can occur when the tumor presses on nerves or other organs near the pancreas. When pain medicine is not enough, there are treatments that act on nerves in the abdomen to relieve the pain.

The doctor may inject medicine into the area around affected nerves or may cut the nerves to block the feeling of pain. Radiation therapy with or without chemotherapy can also help relieve pain by shrinking the tumor.

## Special Enzyme Needs

Surgery to remove the pancreas may affect its ability to make pancreatic enzymes that help to digest food. As a result, you may have problems digesting food and absorbing nutrients into the body. To prevent malnutrition, the doctor may prescribe medicines that replace these enzymes.

# Clinical Trials

Clinical trials are done to find out if new cancer treatments are safe and effective or better than the standard treatment.

People who take part in a clinical trial may receive:

- The standard treatment alone or
- The standard treatment plus the new treatment being studied

Taking part in a clinical trial helps improve the way cancer will be treated in the future. Even when clinical trials do not lead to effective new treatments, they often answer important questions and help move research forward.

Some clinical trials only include people who have not yet received treatment. Other trials test treatments for those whose cancer has not gotten better. There are also clinical trials that test new ways to stop cancer from coming back or reduce the side effects of cancer treatment.

Many of today's standard treatments for cancer are based on earlier clinical trials. Ask if there is a clinical trial right for you.

## As Treatment Progresses

Some tests may be repeated to see how well your treatment is working. Decisions about whether to continue, change, or stop treatment may be based on the results of these tests.

A plan for your long term care will be discussed with your treatment team and shared with your primary care provider.

# Learn More About Pancreatic Cancer

**American Cancer Society**

<https://www.cancer.org/>

**National Cancer Institute**

<https://www.cancer.gov/>

**National Comprehensive Cancer Network Guidelines for Patients**

<https://www.nccn.org/patients/guidelines/cancers.aspx>

**MedlinePlus**

<https://medlineplus.gov/>

**Pancreatic Cancer Action Network**

<https://www.pancan.org/>

# Common Questions

What does my pathology report tell me?

What is the stage of my cancer?

What are my goals for treatment?

What are my treatment choices?

What kind of support services are available for me about finances, emotions, spiritual questions, etc.?



My Health Care Team	Contact Information
Gastroenterologist:	
Navigator:	
Pharmacy:	
Medical Oncologist:	
Radiation Oncologist:	
Nutritionist/Dietitian:	
Surgeon:	
Primary Care Doctor:	
Counselor/Therapist:	
Other:	

## Notes

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