

---

# Pancreatic Cancer Early Detection, Diagnosis, and Staging

Know the signs and symptoms of pancreatic cancer. Find out how pancreatic cancer is tested for, diagnosed, and staged.

## Detection and Diagnosis

Catching cancer early often allows for more treatment options. Some early cancers may have signs and symptoms that can be noticed, but that is not always the case.

- [Can Pancreatic Cancer Be Found Early?](#)
- [Signs and Symptoms of Pancreatic Cancer](#)
- [Tests for Pancreatic Cancer](#)

## Stages and Outlook (Prognosis)

After a cancer diagnosis, staging provides important information about the extent of cancer in the body and anticipated response to treatment.

- [Pancreatic Cancer Stages](#)
- [Survival Rates for Pancreatic Cancer](#)

## Questions to Ask About Pancreatic Cancer

Here are some questions you can ask your cancer care team to help you better understand your cancer diagnosis and treatment options.

- [Questions to Ask About Pancreatic Cancer](#)

# Can Pancreatic Cancer Be Found Early?

Pancreatic cancer is hard to find early. The pancreas is deep inside the body, so early tumors can't be seen or felt by health care providers during routine physical exams. People usually have no [symptoms](#) until the cancer has become very large or has already spread to other organs.

- [Genetic testing for people who might be at increased risk](#)
- [Testing for pancreatic cancer in people at high risk](#)

For certain types of cancer, screening tests or exams are used to look for cancer in people who have no symptoms (and who have not had that cancer before). But for pancreatic cancer, no major professional groups currently recommend routine screening in people who are at average risk. This is because no screening test has been shown to lower the risk of dying from this cancer.

## Genetic testing for people who might be at increased risk

Some people might be at increased risk of pancreatic cancer because of a family history of the disease (or a family history of certain other cancers). Sometimes this increased risk is due to a specific [genetic syndrome](#)<sup>1</sup>.

Genetic testing looks for the [gene changes](#)<sup>2</sup> that cause these inherited conditions and increase pancreatic cancer risk. The tests look for these inherited conditions, not pancreatic cancer itself. Your risk may be increased if you have one of these conditions, but it doesn't mean that you have (or will get) pancreatic cancer.

Knowing if you are at increased risk can help you and your doctor decide if you should have tests to look for pancreatic cancer early, when it might be easier to treat. But determining whether you might be at increased risk is not simple. The American Cancer Society strongly recommends that anyone thinking about genetic testing talk with a genetic counselor, nurse, or doctor (qualified to interpret and explain the test results) *before* getting tested. It's important to understand what the tests can and can't tell you, and what any results might mean, before deciding to be tested.

## Testing for pancreatic cancer in people at high risk

For people in families at high risk of pancreatic cancer, newer tests for detecting

pancreatic cancer early may help. The two most common tests are an endoscopic ultrasound (EUS) or MRI/magnetic resonance cholangiopancreatography (MRCP). (To learn more, see [Tests for Pancreatic Cancer](#).) These tests are not used to screen the general public but might be used for someone with a strong family history of pancreatic cancer or with a known genetic syndrome that increases their risk. Doctors have been able to find early, treatable pancreatic cancers in some members of high-risk families with these tests.

Doctors are also studying other new tests to try to find pancreatic cancer early. (To learn more, see [What's New in Pancreatic Cancer Research?](#)<sup>3</sup>) Interested families at high risk may wish to take part in studies of these new screening tests.

## Hyperlinks

1. [www.cancer.org/cancer/risk-prevention/genetics/family-cancer-syndromes.html](http://www.cancer.org/cancer/risk-prevention/genetics/family-cancer-syndromes.html)
2. [www.cancer.org/cancer/understanding-cancer/genes-and-cancer.html](http://www.cancer.org/cancer/understanding-cancer/genes-and-cancer.html)
3. [www.cancer.org/cancer/types/pancreatic-cancer/about/new-research.html](http://www.cancer.org/cancer/types/pancreatic-cancer/about/new-research.html)

## References

Canto MI. Familial risk factors for pancreatic cancer and screening of high-risk patients. UpToDate website. <https://www.uptodate.com/contents/familial-risk-factors-for-pancreatic-cancer-and-screening-of-high-risk-patients>. Updated Jan 26, 2024. Accessed Feb 5, 2024.

Winter JM, Brody JR, Abrams RA, Lewis NL, Yeo CJ. Chapter 49: Cancer of the Pancreas. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Yabar CS and Winter JM. Pancreatic Cancer: A Review. *Gastroenterol Clin North Am*. 2016; 45(3):429-45. doi: 10.1016/j.gtc.2016.04.003.

Last Revised: February 5, 2024

# Signs and Symptoms of Pancreatic Cancer

Early pancreatic cancers often do not cause any signs or symptoms. By the time they do cause symptoms, they have often grown very large or already spread outside the pancreas.

- [Fatigue or abnormal physical weakness](#)
- [Jaundice and related symptoms](#)
- [Weight loss and poor appetite](#)
- [Belly or back pain](#)
- [Nausea and vomiting](#)
- [Gallbladder or liver enlargement](#)
- [Blood clots](#)
- [Diabetes](#)

## Fatigue or abnormal physical weakness

People with pancreatic cancer will usually feel a lack of energy (fatigue) or physical weakness that is not related to physical activity. This can be associated with difficulty sleeping and a depressed mood. Pancreatic cancer is not the most common cause of fatigue or physical weakness. These symptoms are most often caused by something other than pancreatic cancer.

## Jaundice and related symptoms

**Jaundice** is yellowing of the eyes and skin. Most people with pancreatic cancer (and nearly all people with ampullary cancer) will have jaundice as one of their first symptoms.

Jaundice is caused by the buildup of bilirubin, a dark yellow-brown substance made in the liver. Normally, the liver releases a liquid called **bile** that contains bilirubin. Bile goes through the common bile duct into the intestines, where it helps break down fats. It eventually leaves the body in the stool. When the common bile duct becomes blocked, bile can't reach the intestines, and the amount of bilirubin in the body builds up.

Cancers that start in the head of the pancreas are near the common bile duct. These cancers can press on the duct and cause jaundice while they are still fairly small, which

can sometimes lead to these tumors being found at an early stage. But cancers that start in the body or tail of the pancreas tend not to press on the duct until they have spread through the pancreas. By this time, the cancer has often spread beyond the pancreas.

When pancreatic cancer spreads, it often goes to the liver. This can also cause jaundice.

There are other signs of jaundice as well as the yellowing of the eyes and skin:

- **Dark urine:** Sometimes, the first sign of jaundice is darker urine. As bilirubin levels in the blood increase, the urine becomes brown in color.
- **Light-colored or greasy stools:** Bilirubin normally helps give stools their brown color. If the bile duct is blocked, stools might be light-colored or gray. Also, if bile and pancreatic enzymes can't get through to the intestines to help break down fats, the stools can become greasy and might float in the toilet.
- **Itchy skin:** When bilirubin builds up in the skin, it can start to itch as well as turn yellow.

Pancreatic cancer is not the most common cause of jaundice. Other causes, such as gallstones, hepatitis, and other liver and bile duct diseases, are much more common.

## Weight loss and poor appetite

Unintended weight loss is very common in people with pancreatic cancer. These people often have little or no appetite.

## Belly or back pain

Pain in the abdomen (belly) or back is common in pancreatic cancer. Cancers that start in the body or tail of the pancreas can grow fairly large and start to press on other nearby organs, causing pain. The cancer may also spread to the nerves surrounding the pancreas, which often causes back pain. Pancreatic cancer is not the most common cause of belly or back pain. These symptoms are most often caused by something other than pancreatic cancer.

## Nausea and vomiting

If the cancer presses on the far end of the stomach, it can partly block it, making it hard

for food to get through. This can cause nausea, vomiting, and pain that tend to be worse after eating.

## Gallbladder or liver enlargement

If the cancer blocks the bile duct, bile can build up in the gallbladder, making it larger. Sometimes a doctor can feel this (as a large lump under the right side of the rib cage) during a physical exam. It can also be seen on [imaging tests](#).

Pancreatic cancer can also sometimes enlarge the liver, especially if the cancer has spread there. The doctor might be able to feel the edge of the liver below the right rib cage on an exam, or the large liver might be seen on imaging tests.

## Blood clots

Sometimes, the first clue that someone has pancreatic cancer is a [blood clot](#)<sup>1</sup> in a large vein, often in the leg. This is called a **deep vein thrombosis** or DVT. Symptoms can include pain, swelling, redness, and warmth in the affected leg. Sometimes a piece of the clot can break off and travel to the lungs, which might make it hard to breathe or cause chest pain. A blood clot in the lungs is called a **pulmonary embolism** or PE.

Pancreatic cancer is not the most common cause of blood clots. Most blood clots are caused by other things.

## Diabetes

Pancreatic cancer can cause diabetes (high blood sugar) because the tumor destroys the insulin-making cells in the pancreas. Symptoms can include feeling thirsty and hungry, and having to urinate often. More often, cancer can lead to small changes in blood sugar levels that don't cause symptoms of diabetes but can still be detected with blood tests.

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts/blood-clots.html](http://www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts/blood-clots.html)

## References

Castillo CF. Clinical manifestations, diagnosis, and staging of exocrine pancreatic cancer. UpToDate website. <https://www.uptodate.com/contents/clinical-manifestations-diagnosis-and-staging-of-exocrine-pancreatic-cancer>. Updated October 13, 2023. Accessed Feb 5, 2024.

National Cancer Institute. Physician Data Query (PDQ). Pancreatic Cancer Treatment – for Health Professionals. 2024. Accessed at <https://www.cancer.gov/types/pancreatic/hp/pancreatic-treatment-pdq> on Feb 5, 2024.

Winter JM, Brody JR, Abrams RA, Lewis NL, Yeo CJ. Chapter 49: Cancer of the Pancreas. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Last Revised: February 5, 2024

---

## Tests for Pancreatic Cancer

If a person has [signs and symptoms](#) that might be caused by pancreatic cancer, certain exams and tests will be done to find the cause. If cancer is found, more tests will be done to help determine the extent (stage) of the cancer.

- [Medical history and physical exam](#)
- [Imaging tests](#)
- [Blood tests](#)
- [Biopsy](#)
- [Genetic counseling and testing](#)

### Medical history and physical exam

Your doctor will ask about your medical history to learn more about your symptoms. They might also ask about possible risk factors, including smoking and your family history.

Your doctor will examine you to look for signs of pancreatic cancer or other health problems. Pancreatic cancer can sometimes cause the liver or gallbladder to swell, which the doctor might be able to feel during the exam. Your skin and the whites of your

eyes will also be checked for jaundice (yellowing).

If the results of the exam are abnormal, your doctor will order tests to help find the problem. You might also be referred to a gastroenterologist (a doctor who treats digestive system diseases) for further tests and treatment.

## Imaging tests

Imaging tests use x-rays, magnetic fields, sound waves, or radioactive substances to create pictures of the inside of your body. Imaging tests might be done for many reasons both before and after a diagnosis of pancreatic cancer, including:

- To look for suspicious areas that might be cancer
- To learn how far cancer may have spread
- To help determine if treatment is working
- To look for signs of cancer coming back after treatment

## Computed tomography (CT) scan

The [CT scan](#)<sup>1</sup> makes detailed cross-sectional images of your body. CT scans are often used to diagnose pancreatic cancer because they can show the pancreas fairly clearly. They can also help show if cancer has spread to organs near the pancreas, as well as to lymph nodes and distant organs. A CT scan can help determine if surgery might be a good treatment option.

If your doctor thinks you might have pancreatic cancer, you might get a special type of CT known as a **multiphase CT scan** or a **pancreatic protocol CT scan**. During this test, different sets of CT scans are taken over several minutes after you get an injection of an intravenous (IV) contrast.

## Magnetic resonance imaging (MRI)

[MRI scans](#)<sup>2</sup> use radio waves and strong magnets instead of x-rays to make detailed images of parts of your body. Most doctors prefer to look at the pancreas with CT scans. However, MRIs of the pancreas are sometimes done, especially if the goal is to look for smaller metastatic spots in the liver.

Special types of MRI scans can be used in people who might have pancreatic cancer or are at high risk:



- **MR cholangiopancreatography (MRCP)**, which can be used to look at the pancreatic and bile ducts, is described below in the section on cholangiopancreatography.
- **MR angiography (MRA)**, which looks at blood vessels, is mentioned below in the section on angiography.

## Ultrasound

[Ultrasound](#)<sup>3</sup> (US) tests use sound waves to create images of organs such as the pancreas. The two most used types for pancreatic cancer are:

- **Abdominal ultrasound:** If it's not clear what might be causing a person's abdominal symptoms, this might be the first test done because it is easy to do and it doesn't expose a person to radiation. But if signs and symptoms are more likely to be caused by pancreatic cancer, a CT scan is often more useful.
- **Endoscopic ultrasound (EUS)**<sup>4</sup>: This test is more accurate than abdominal US and can be very helpful in diagnosing and staging pancreatic cancer. This test is done with a small probe on the tip of an endoscope, which is a thin, flexible tube that doctors use to look inside the digestive tract and to get biopsy samples of a tumor.

## Cholangiopancreatography

This is an imaging test that looks at the pancreatic ducts and bile ducts to see if they are blocked, narrowed, or dilated. These tests can help show if someone might have a pancreatic tumor that is blocking a duct. They can also be used to help plan surgery. The test can be done in different ways, each of which has pros and cons.

**Endoscopic retrograde cholangiopancreatography (ERCP)**<sup>5</sup>: 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. The doctor can see through the endoscope to find the ampulla of Vater (where the common bile duct empties into the small intestine).

X-rays taken at this time can show narrowing or blockage in these ducts that might be due to pancreatic cancer. The doctor doing this test can put a small brush through the tube to remove cells for a biopsy or place a [stent](#)<sup>6</sup> (small tube) into a bile or pancreatic duct to keep it open if a nearby tumor is pressing on it.

**Magnetic resonance cholangiopancreatography (MRCP):** This is a noninvasive way to look at the pancreatic and bile ducts using the same type of machine used for standard MRI scans. Unlike ERCP, it does not require an infusion of a contrast dye. Because this test is noninvasive, doctors often use MRCP if the purpose is just to look at the pancreatic and bile ducts. But this test can't be used to get biopsy samples of tumors or to place stents in ducts.

**Percutaneous transhepatic cholangiography (PTC):** In this procedure, the doctor puts a thin, hollow needle through the skin of the belly and into a bile duct within the liver. A contrast dye is then injected through the needle, and x-rays are taken as it passes through the bile and pancreatic ducts. As with ERCP, this approach can also be used to take fluid or tissue samples or to place a stent into a duct to help keep it open. Because it is more invasive (and might cause more pain), PTC is not usually used unless ERCP has already been tried or can't be done for some reason.

### **Positron emission tomography (PET) scan**

For a [PET scan](#)<sup>7</sup>, you are injected with a slightly radioactive form of sugar, which collects mainly in cancer cells. A special camera is then used to create a picture of areas of radioactivity in the body.

This test is used to look for the possible spread of cancer (metastasis).

**PET/CT scan:** Special machines can do both a PET and CT scan at the same time. This lets the doctor compare areas of higher radioactivity on the PET scan with the more detailed appearance of that area on the CT scan. This test can help determine the [stage \(extent\) of the cancer](#). It might be especially useful for spotting cancer that has spread beyond the pancreas and wouldn't be treatable by surgery.

### **Blood tests**

Several types of blood tests can help guide decisions on the management of pancreatic cancer.

**Liver function tests:** Jaundice (yellowing of the skin and eyes) is often one of the first signs of pancreatic cancer. Doctors often get blood tests to assess liver function in people with jaundice to help determine its cause. Certain blood tests can look at levels of different kinds of bilirubin (a chemical made by the liver) and can help tell whether a patient's jaundice is caused by disease in the liver itself or by a blockage of bile flow (from a gallstone, a tumor, or other disease).

**Tumor markers:** Tumor markers are substances that can sometimes be found in the blood when a person has cancer. Tumor markers that may be helpful in pancreatic cancer are:

- **CA 19-9**
- **Carcinoembryonic antigen (CEA)**, which is not used as often as CA 19-9

Neither of these tumor marker tests is accurate enough to tell for sure if someone has pancreatic cancer. Levels of these tumor markers are not high in all people with pancreatic cancer, and some people who don't have pancreatic cancer might have high levels of these markers for other reasons. Still, these tests can sometimes be helpful, along with other tests, in figuring out if someone has cancer.

In people already known to have pancreatic cancer and who have high CA19-9 or CEA levels, these levels can be measured over time to help tell how well treatment is working. If all the cancer has been removed, these tests can also be done to look for signs of the cancer e coming back.

**Other blood tests:** Other tests, like a [CBC or chemistry panel](#)<sup>8</sup>, can help evaluate a person's general health (such as bone marrow function and kidney). These tests can help determine if they'll be able to withstand the stress of a major operation.

## Biopsy

A person's medical history, physical exam, and imaging test results may strongly suggest pancreatic cancer, but the only way to be sure is to remove a small sample of tumor and look at it under the microscope. This procedure is called a **biopsy**. Biopsies can be done in different ways.

**Percutaneous (through the skin) biopsy:** For this test, a doctor inserts a thin, hollow needle through the skin to remove a small piece of a tumor. This is known as a **fine needle aspiration** (FNA). The doctor guides the needle into place using images from ultrasound or CT scans.

**Endoscopic biopsy:** Doctors can also biopsy a tumor during an endoscopy. The doctor passes an endoscope (a thin, flexible, tube with a small video camera on the end) down the throat and into the small intestine near the pancreas. At this point, the doctor can either use endoscopic ultrasound (EUS) to pass a needle into the tumor or endoscopic retrograde cholangiopancreatography (ERCP) to place a brush to remove cells from the bile or pancreatic ducts.

**Surgical biopsy:** Surgical biopsies are now done less often than in the past. They can be useful if the surgeon is concerned the cancer has spread beyond the pancreas and wants to look at (and possibly biopsy) other organs in the abdomen. The most common way to do a surgical biopsy is to use [laparoscopy](#)<sup>9</sup> (sometimes called **keyhole surgery**). The surgeon can look at the pancreas and other organs for tumors and take biopsy samples of abnormal areas.

### Some people might not need a biopsy

For patients with resectable disease based on imaging tests, the surgeon could proceed directly with surgery, at which time the tumor cells can be looked at in the lab to confirm the diagnosis. During surgery, if the doctor finds that the cancer has spread too far to be removed completely, only a sample of the cancer may be removed to confirm the diagnosis, and the rest of the planned operation will be stopped.

If treatment (such as chemotherapy or radiation) is planned before surgery, a biopsy is needed first to be sure of the diagnosis.

### Lab tests of biopsy samples

The samples obtained during a biopsy (or during surgery) are sent to a lab, where they are looked at under a microscope to see if they contain cancer cells.

If cancer is found, other tests might be done as well. For example, tests might be done to see if the cancer cells have mutations (changes) in certain genes, such as *ALK*, *NRG1*, *NTRK*, *ROS1*, *FGFR2*, *RET*, *BRAF*, *BRCA1/2*, *KRAS*, *PALB2*, or *HER2*. This might affect whether certain [targeted therapy drugs](#)<sup>10</sup> might be helpful as part of treatment.

See [Testing Biopsy and Cytology Specimens for Cancer](#)<sup>11</sup> to learn more about different types of biopsies, how the biopsy samples are tested in the lab, and what the results will tell you.

### Genetic counseling and testing

If you've been diagnosed with pancreatic cancer or if you have a family history of pancreatic cancer, your doctor might suggest speaking with a genetic counselor to determine if you could benefit from genetic testing.

Some people with pancreatic cancer have gene mutations (such as *BRCA* mutations) in all the cells of their body, which put them at increased risk for pancreatic cancer (and

possibly other cancers). Testing for these gene mutations can sometimes affect which treatments might be helpful. It might also affect whether other family members should consider genetic counseling and testing as well.

For more information on genetic testing, see [Genetics and Cancer](#)<sup>12</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/ct-scan-for-cancer.html](http://www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/ct-scan-for-cancer.html)
2. [www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/mri-for-cancer.html](http://www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/mri-for-cancer.html)
3. [www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/ultrasound-for-cancer.html](http://www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/ultrasound-for-cancer.html)
4. [www.cancer.org/cancer/diagnosis-staging/tests/endoscopy/upper-endoscopy.html](http://www.cancer.org/cancer/diagnosis-staging/tests/endoscopy/upper-endoscopy.html)
5. [www.cancer.org/cancer/diagnosis-staging/tests/endoscopy/upper-endoscopy.html](http://www.cancer.org/cancer/diagnosis-staging/tests/endoscopy/upper-endoscopy.html)
6. [www.cancer.org/cancer/types/pancreatic-cancer/treating/surgery.html](http://www.cancer.org/cancer/types/pancreatic-cancer/treating/surgery.html)
7. [www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/nuclear-medicine-scans-for-cancer.html](http://www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/nuclear-medicine-scans-for-cancer.html)
8. [www.cancer.org/cancer/diagnosis-staging/tests/understanding-your-lab-test-results.html](http://www.cancer.org/cancer/diagnosis-staging/tests/understanding-your-lab-test-results.html)
9. [www.cancer.org/cancer/diagnosis-staging/tests/endoscopy/laparoscopy.html](http://www.cancer.org/cancer/diagnosis-staging/tests/endoscopy/laparoscopy.html)
10. [www.cancer.org/cancer/types/pancreatic-cancer/treating/targeted-therapy.html](http://www.cancer.org/cancer/types/pancreatic-cancer/treating/targeted-therapy.html)
11. [www.cancer.org/cancer/diagnosis-staging/tests/biopsy-and-cytology-tests.html](http://www.cancer.org/cancer/diagnosis-staging/tests/biopsy-and-cytology-tests.html)
12. [www.cancer.org/cancer/risk-prevention/genetics.html](http://www.cancer.org/cancer/risk-prevention/genetics.html)

## References

Mauro LA, Herman JM, Jaffee EM, Laheru DA. Chapter 81: Carcinoma of the pancreas. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014.

National Cancer Institute. Physician Data Query (PDQ). Pancreatic Cancer Treatment – for Health Professionals. 2024. Accessed at <https://www.cancer.gov/types/pancreatic/hp/pancreatic-treatment-pdq> on Feb 5, 2024.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Pancreatic Adenocarcinoma. V.1.2024. Accessed at [https://www.nccn.org/professionals/physician\\_gls/pdf/pancreatic.pdf](https://www.nccn.org/professionals/physician_gls/pdf/pancreatic.pdf) on Feb 5, 2024.

Winter JM, Brody JR, Abrams RA, Lewis NL, Yeo CJ. Chapter 49: Cancer of the Pancreas. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Last Revised: February 5, 2024

## Pancreatic Cancer Stages

After someone is diagnosed with pancreatic cancer, doctors will try to figure out if it has spread, and if so, how far. This process is called **staging**. The stage of a cancer describes how much cancer is in the body. The earliest stage of pancreas cancer is stage 0 (carcinoma *in situ*), and then ranges from stages I (1) through IV (4). As a rule, the lower the number, the less the cancer has spread. A higher number, such as stage IV, means a more advanced cancer.

- [How is the stage determined?](#)
- [Stages of pancreatic cancer](#)
- [Resectable versus unresectable pancreatic cancer](#)
- [Other prognostic factors](#)
- [Tumor markers \(CA 19-9\)](#)

For pancreatic cancer, doctors use the cancer's stage to discuss survival statistics. However, for discussions on how best to treat pancreatic cancer, that is based on whether the tumor can be surgically removed, also described as whether the tumor is resectable. Upon diagnosis, pancreatic cancer is described as either resectable, borderline resectable, or unresectable (see below for more information).

### How is the stage determined?

The staging system used most often for pancreatic cancer is the **AJCC** (American Joint Committee on Cancer) **TNM** system, which is based on 3 key pieces of information:

- The extent of the **tumor (T)**: How large is the tumor and has it grown outside the pancreas into nearby blood vessels?
- The spread to nearby **lymph nodes (N)**: Has the cancer spread to nearby lymph

nodes? If so, how many of the lymph nodes have cancer?

- The spread (**metastasized**) to distant sites (**M**): Has the cancer spread to distant lymph nodes or distant organs, such as the liver, peritoneum (the lining of the abdominal cavity), lungs, or bones?

The system described below is the most recent AJCC system, effective December 2023. It is used to stage most pancreatic cancers except for pancreatic neuroendocrine tumors (NETs), which have their own staging system.

The staging system in the table uses the **pathologic stage**. It is determined by examining tissue removed during an operation. This is also known as the *surgical stage*. Sometimes, if the doctor's physical exam, imaging, or other tests show the tumor is too large or has spread to nearby organs and cannot be removed by surgery right away or at all, radiation or chemotherapy might be given first. In this case, the cancer will have a **clinical stage**. It is based on the results of physical exam, biopsy, and imaging tests (see [Tests for Pancreatic Cancer](#)). The clinical stage can be used to help plan treatment. To learn more, see [Cancer Staging](#)<sup>1</sup>.

Numbers or letters after T, N, and M provide more details about each of these factors. Higher numbers mean the cancer is more advanced. Once a person's T, N, and M categories have been determined, this information is combined in a process called **stage grouping** to assign an overall stage.

Cancer staging can be complex. If you have any questions about your stage, please ask your doctor to explain it to you in a way you understand. (Additional information of the TNM system also follows the stage table below.)

## Stages of pancreatic cancer

AJCC Stage	Stage grouping	Stage description*
0	Tis N0 M0	The cancer is confined to the top layers of pancreatic duct cells and has not invaded deeper tissues. It has not spread outside of the pancreas. These tumors are sometimes referred to as carcinoma <i>in situ</i> (Tis). This category includes the precancers, such as high-grade pancreatic intraepithelial neoplasia (PanIn-3), intraductal papillary mucinous neoplasm with high-grade dysplasia, intraductal tubulopapillary neoplasm with high-grade dysplasia, and mucinous cystic neoplasm with high-grade dysplasia.

		It has not spread to nearby lymph nodes (N0) or to distant sites (M0).
IA	T1	The cancer is confined to the pancreas and is no bigger than 2 cm across (T1).  It has not spread to nearby lymph nodes (N0) or to distant sites (M0).
	N0	
	M0	
IB	T2	The cancer is confined to the pancreas and is larger than 2 cm but no more than 4cm across (T2).  It has not spread to nearby lymph nodes (N0) or to distant sites (M0).
	N0	
	M0	
IIA	T3	The cancer is confined to the pancreas and is bigger than 4 cm across (T3).  It has not spread to nearby lymph nodes (N0) or to distant sites (M0).
	N0	
	M0	
IIB	T1	The cancer is confined to the pancreas and is no bigger than 2 cm across (T1) <b>AND</b> it has spread to no more than 3 nearby lymph nodes (N1).  It has not spread to distant sites (M0).
	N1	
	M0	
	T2	The cancer is confined to the pancreas and is larger than 2 cm but no more than 4 cm across (T2) <b>AND</b> it has spread to no more than 3 nearby lymph nodes (N1).  It has not spread to distant sites (M0).
	N1	
	M0	
	T3	The cancer is confined to the pancreas and is bigger than 4 cm across (T3) <b>AND</b> it has spread to no more than 3 nearby lymph nodes (N1).  It has not spread to distant sites (M0).
	N1	
	M0	
III	T1	The cancer is confined to the pancreas and is no bigger than 2 cm across (T1) <b>AND</b> it has spread to 4 or more nearby lymph nodes (N2).  It has not spread to distant sites (M0).
	N2	
	M0	
	OR	
	T2	The cancer is confined to the pancreas and is larger than 2 cm but



	N2	no more than 4 cm across (T2) <b>AND</b> it has spread to 4 or more nearby lymph nodes (N2).
	M0	It has not spread to distant sites (M0).
	OR	
	T3	The cancer is confined to the pancreas and is bigger than 4 cm across (T3) <b>AND</b> it has spread to 4 or more nearby lymph nodes (N2).
	N2	(N2).
	M0	It has not spread to distant sites (M0).
OR		
	T4	The cancer is growing outside the pancreas and into nearby major blood vessels (T4). The cancer may or may not have spread to nearby lymph nodes (Any N).
	Any N	
	M0	It has not spread to distant sites (M0).
IV	Any T Any N M1	The cancer has spread to distant sites such as the liver, peritoneum (the lining of the abdominal cavity), lungs or bones (M1). It can be any size (Any T) and might or might not have spread to nearby lymph nodes (Any N).

\* The following additional categories are not listed on the table above:

- TX: The main tumor cannot be assessed due to lack of information.
- T0: There is no evidence of a primary tumor.
- NX: Regional lymph nodes cannot be assessed due to lack of information.

## Resectable versus unresectable pancreatic cancer

The AJCC staging system gives a detailed summary of how far the cancer has spread. But for treatment purposes, doctors use a simpler staging system, which divides cancers into groups based on whether they can be removed (resected) with surgery:

- Resectable
- Borderline resectable
- Unresectable (either locally advanced or metastatic)

## Resectable

If the cancer is only in the pancreas (or has spread just beyond it) and the surgeon believes the entire tumor can be removed, it is called resectable.

It's important to note that some cancers might appear to be resectable based on [imaging tests](#)<sup>2</sup>, but once surgery is started it might become clear that not all of the cancer can be removed. If this happens, only some of the cancer may be removed to confirm the diagnosis (if a [biopsy](#)<sup>3</sup> hasn't been done already), and the rest of the planned operation will be stopped to help avoid the risk of major side effects.

## Borderline resectable

This term is used to describe a pancreatic tumor that is touching and possibly surrounding a small part of nearby blood vessels. However, after initial chemo or a combination of chemo and radiation, the surgeon may still be able to remove the tumor completely. The definition of borderline resectable varies, regarding exactly which vessels and to what extent the tumor can surround those vessels.

## Unresectable

These cancers can't be removed entirely by surgery.

**Locally advanced:** If the cancer has not spread to distant organs but it still can't be removed completely with surgery, it is called locally advanced. Often the reason the cancer can't be removed is because it has grown into or surrounded nearby major blood vessels.

Surgery to try to remove these tumors would be very unlikely to be helpful and would have major side effects. Certain procedures could still be done, but they would be less extensive with the goal of preventing or relieving symptoms like a blocked bile duct, instead of trying to remove the pancreatic tumor.

**Metastatic:** If the cancer has spread to distant organs, it is called metastatic (Stage IV). These cancers can't be removed completely. Certain procedures could still be done, but the goal would be to prevent or relieve symptoms, not to try to cure the cancer.

## Other prognostic factors

Although not formally part of the TNM system, other factors are also important in determining a person's prognosis (outlook).

### **Tumor grade**

The grade describes how closely the cancer looks like normal tissue under a microscope.

- Grade 1 (G1) means the cancer looks much like normal pancreas tissue.
- Grade 3 (G3) means the cancer looks very abnormal.
- Grade 2 (G2) falls somewhere in between.

Low-grade cancers (G1) tend to grow and spread more slowly than high-grade (G3) cancers. Most of the time, Grade 3 pancreatic cancers tend to have a poor prognosis (outlook) compared to Grade 1 or 2 cancers.

### **Extent of resection**

For patients who have surgery, another important factor is the extent of the resection — whether or not all of the tumor is removed:

- **R0:** All the cancer is thought to have been removed. (There are no visible or microscopic signs suggesting that cancer was left behind.)
- **R1:** All visible tumor was removed, but lab tests of the removed tissue show that some small areas of cancer were probably left behind.
- **R2:** Some visible tumor could not be removed.

### **Tumor markers (CA 19-9)**

Tumor markers are substances that can sometimes be found in the blood when a person has cancer. CA 19-9 is a tumor marker that is helpful in pancreatic cancer. A drop in the CA 19-9 level after surgery (compared to the level before surgery) tends to predict a better prognosis (outlook).

There are other reasons why CA19-9 may be elevated, including biliary infection or obstruction. These reasons may be due to other causes and not be cancer related. Some people with pancreatic cancer may not make CA 19-9 and would always have low levels.

## Hyperlinks

1. [www.cancer.org/cancer/diagnosis-staging/staging.html](http://www.cancer.org/cancer/diagnosis-staging/staging.html)
2. [www.cancer.org/cancer/diagnosis-staging/tests.html](http://www.cancer.org/cancer/diagnosis-staging/tests.html)
3. [www.cancer.org/cancer/diagnosis-staging/tests/testing-biopsy-and-cytology-specimens-for-cancer.html](http://www.cancer.org/cancer/diagnosis-staging/tests/testing-biopsy-and-cytology-specimens-for-cancer.html)

## References

American Joint Committee on Cancer. Exocrine Pancreas. In: *AJCC Cancer Staging Manual*. 8<sup>th</sup> ed. New York, NY: Springer; 2017:337.

Isaji S, Mizuno S, Windsor JA, et al. International consensus on definition and criteria of borderline resectable pancreatic ductal adenocarcinoma 2017. *Pancreatology*. 2018 Jan;18(1):2-11. doi: 10.1016/j.pan.2017.11.011. Epub 2017 Nov 22.

Last Revised: February 5, 2024

---

# Survival Rates for Pancreatic Cancer

Survival rates can give you an idea of what percentage of people with the same type and stage of cancer are still alive a certain amount of time (usually 5 years) after they were diagnosed. They can't tell you how long you will live, but they may help give you a better understanding of how likely it is that your treatment will be successful.

- [What is a 5-year relative survival rate?](#)
- [Where do these numbers come from?](#)
- [5-year relative survival rates for pancreatic cancer](#)
- [Understanding the numbers](#)

**Keep in mind that survival rates are estimates and are often based on previous outcomes of large numbers of people who had a specific cancer, but they can't**

**predict what will happen in any particular person’s case. These statistics can be confusing and may lead you to have more questions. Ask your doctor how these numbers might apply to you.**

## What is a 5-year relative survival rate?

A **relative survival rate** compares people with the same type and stage of pancreatic cancer to people in the overall population. For example, if the **5-year relative survival rate** for a specific stage of pancreatic cancer is 50%, it means that people who have that cancer are, on average, about 50% as likely as people who don’t have that cancer to live for at least 5 years after being diagnosed.

## Where do these numbers come from?

The American Cancer Society relies on information from the Surveillance, Epidemiology, and End Results (SEER) database, maintained by the National Cancer Institute (NCI), to provide survival statistics for different types of cancer.

The SEER database tracks 5-year relative survival rates for pancreatic cancer in the United States, based on how far the cancer has spread. The SEER database, however, does not group cancers by [AJCC TNM stages](#) (stage 1, stage 2, stage 3, etc.). Instead, it groups cancers into localized, regional, and distant stages:

- **Localized:** There is no sign that the cancer has spread outside of the pancreas.
- **Regional:** The cancer has spread from the pancreas to nearby structures or lymph nodes.
- **Distant:** The cancer has spread to distant parts of the body, such as the lungs, liver, or bones.

## 5-year relative survival rates for pancreatic cancer

Based on people diagnosed with pancreatic cancer between 2013 and 2019.

SEER* Stage	5-year Relative Survival Rate
Localized	44%
Regional	16%
Distant	3%

All SEER stages combined	13%
--------------------------	-----

\* SEER = Surveillance, Epidemiology, and End Results

## Understanding the numbers

- **These numbers apply only to the stage of the cancer when it is first diagnosed.** They do not apply later if the cancer grows, spreads, or comes back after treatment.
- **These numbers don't take everything into account.** Survival rates are grouped based on how far the cancer has spread, but your age, overall health, how well the cancer responds to treatment, [tumor grade](#), [extent of resection](#), [level of tumor marker \(CA 19-9\)](#), and other factors will also affect your outlook.
- **People now being diagnosed with pancreatic cancer may have a better outlook than these numbers show.** Treatments improve over time, and these numbers are based on people who were diagnosed and treated at least five years earlier.

## References

American Cancer Society. *Cancer Facts & Figures 2024*. Atlanta: American Cancer Society; 2024.

Ruhl JL, Callaghan C, Hurlbut, A, Ries LAG, Adamo P, Dickie L, Schussler N (eds.) Summary Stage 2018: Codes and Coding Instructions, National Cancer Institute, Bethesda, MD, 2018.

Last Revised: February 5, 2024

# Questions to Ask About Pancreatic Cancer

It's important to have honest, open discussions with your cancer care team. They want to answer all your questions, so that you can make informed treatment and life decisions. Here are some questions to consider.

- [When you're told you have pancreatic cancer](#)
- [When deciding on a treatment plan](#)
- [During treatment](#)
- [After treatment](#)

## When you're told you have pancreatic cancer

- What [kind of pancreatic cancer](#)<sup>1</sup> do I have?
- Has my cancer spread beyond the pancreas?
- Is the tumor resectable (removable by surgery)?
- Will I need any other [tests](#) before we can decide on treatment?
- Do I need to see any other doctors or health professionals?
- If I'm concerned about the costs and insurance coverage for my diagnosis and treatment, who can help me?

## When deciding on a treatment plan

- What are my [treatment options](#)<sup>2</sup>?
- What do you recommend and why?
- How quickly do we need to decide on treatment?
- How much experience do you have treating this type of cancer?
- What is the goal of each treatment?
- Should I get a [second opinion](#)<sup>3</sup>? How do I do that? Can you recommend a doctor or cancer center?
- Should I think about taking part in a [clinical trial](#)<sup>4</sup>?
- What should I do to be ready for treatment?
- How long will treatment last? What will it be like? Where will it be done?
- What risks or side effects should I expect? How long are they likely to last?
- Will treatment affect my daily activities?

## During treatment

Once treatment begins, you'll need to know what to expect and what to look for. Not all of these questions may apply to you, but asking the ones that do may be helpful.

- How will we know if the treatment is working?
- Is there anything I can do to help manage [side effects](#)<sup>5</sup>?
- What symptoms or side effects should I tell you about right away?
- How can I reach you on nights, holidays, or weekends?
- Do I need to change what I eat during treatment?
- Are there any limits on what I can do?
- Can I exercise during treatment? If so, what kind should I do, and how often?
- Can you suggest a mental health professional I can see if I start to feel [overwhelmed, depressed, or distressed](#)<sup>6</sup>?
- What if I need social support during treatment because my family lives far away?

## After treatment

- What type of [follow-up](#)<sup>7</sup> will I need after treatment?
- Are there any limits on what I can do?
- Do I need a special diet after treatment?
- How much and what of exercise should I do?
- How will we know if the cancer has come back? What should I watch for?
- What will my options be if the cancer comes back?

Along with these sample questions, be sure to write down some of your own. For instance, you might want more information about recovery times. You may also want to ask about [clinical trials](#)<sup>8</sup> for which you may qualify.

Keep in mind that doctors aren't the only ones who can give you information. Other health care professionals, such as nurses and social workers, can answer some of your questions. To find out more about speaking with your health care team, see [The Doctor-Patient Relationship](#)<sup>9</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/types/pancreatic-cancer/about/what-is-pancreatic-cancer.html](http://www.cancer.org/cancer/types/pancreatic-cancer/about/what-is-pancreatic-cancer.html)
2. [www.cancer.org/cancer/types/pancreatic-cancer/treating.html](http://www.cancer.org/cancer/types/pancreatic-cancer/treating.html)
3. [www.cancer.org/cancer/managing-cancer/finding-care/seeking-a-second-opinion.html](http://www.cancer.org/cancer/managing-cancer/finding-care/seeking-a-second-opinion.html)



4. [www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html](http://www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html)
5. [www.cancer.org/cancer/managing-cancer/side-effects.html](http://www.cancer.org/cancer/managing-cancer/side-effects.html)
6. [www.cancer.org/cancer/managing-cancer/side-effects/changes-in-mood-or-thinking.html](http://www.cancer.org/cancer/managing-cancer/side-effects/changes-in-mood-or-thinking.html)
7. [www.cancer.org/cancer/types/pancreatic-cancer/after-treatment.html](http://www.cancer.org/cancer/types/pancreatic-cancer/after-treatment.html)
8. [www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html](http://www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html)
9. [www.cancer.org/cancer/managing-cancer/finding-care/the-doctor-patient-relationship.html](http://www.cancer.org/cancer/managing-cancer/finding-care/the-doctor-patient-relationship.html)

Last Revised: February 5, 2024

### Written by

The American Cancer Society medical and editorial content team  
(<https://www.cancer.org/cancer/acs-medical-content-and-news-staff.html>)

Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as journalists, editors, and translators with extensive experience in medical writing.

American Cancer Society medical information is copyrighted material. For reprint requests, please see our Content Usage Policy ([www.cancer.org/about-us/policies/content-usage.html](http://www.cancer.org/about-us/policies/content-usage.html)).

**cancer.org | 1.800.227.2345**