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

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?[3]) 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
2. www.cancer.org/cancer/understanding-cancer/genes-and-cancer.html
3. www.cancer.org/cancer/types/pancreatic-cancer/about/new-research.html

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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

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[1] 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

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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

- **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[3] (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:0 0 1 95.35 656 Tm /F1 12 Tf 0 0 656/F2 12 Tf 0 0 0 rg /GS295 g92 iXc

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[7], 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:

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[9] (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[10] might be helpful as part of treatment.

See Testing Biopsy and Cytology Specimens for Cancer[11] 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[12].

Hyperlinks

1. 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
3. 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
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11. www.cancer.org/cancer/diagnosis-staging/tests/biopsy-and-cytology-tests.html
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Pancreatic Cancer Stages

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[1]*.*

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

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[2], 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[3] 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: lfu gs0exuld /GS764 grg /e

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.

I

Hyperlinks

1. www.cancer.org/cancer/diagnosis-staging/staging.html
2. www.cancer.org/cancer/diagnosis-staging/tests.html
3. www.cancer.org/cancer/diagnosis-staging/tests/testing-biopsy-and-cytology-specimens-for-cancer.html

References

Survival Rates for Pancreatic Cancer

predict what will happen in any particular person’s case. These statistics can be

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 we uJ95.35 548.07 Tm 0 7q48.070,nreme, and these

Questions to Ask About Pancreatic Cancer

When you’re told you have pancreatic cancer

- How will we know if the treatment is working?
- Is there anything I can do to help manage side effects[5]?
- 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[6]?
- What if I need social support during treatment because my family lives far away?

After treatment

- What type of follow-up[7] 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[8] 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[9].

Hyperlinks

1. www.cancer.org/cancer/types/pancreatic-cancer/about/what-is-pancreatic-cancer.html
2. www.cancer.org/cancer/types/pancreatic-cancer/treating.html
3. 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
5. www.cancer.org/cancer/managing-cancer/side-effects.html
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8. 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

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