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NCCN Guidelines for Patients®

Version 1.2014

# Pancreatic Cancer



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## Tribute to Debra (“Debbie”) Hampton

This book is dedicated in memory of Debra (“Debbie”) Hampton, a beloved employee of NCCN. Debbie worked as the Manager of the Oncology Research Program for over 12 years and was passionate and dedicated to the mission of supporting important research to find better treatments for cancer. Debbie lost her own three-year battle with pancreatic cancer on February 22, 2013, at the young age of 58. Those who worked with Debbie know that she would be thrilled to have her legacy include helping others who are going through the difficult diagnosis and treatment for pancreatic cancer. If she could, she would be telling people diagnosed with pancreatic cancer to keep trying and not give up, and to live every day to its fullest as she taught us all to do. May this book help “chart the course” for patients and their caregivers and serve to remind people that researchers everywhere are working fervently to find a cure for this disease.



# Pancreatic Cancer

Learning that you have cancer can be overwhelming. The goal of this book is to help you get the best care. It explains which tests and treatments are recommended by experts in pancreatic cancer.

The National Comprehensive Cancer Network® (NCCN®) is a not-for-profit alliance of 25 of the world's leading cancer centers. Experts from NCCN have written treatment guidelines for doctors who treat pancreatic cancer. These treatment guidelines suggest what the best practice is for cancer care. The information in this patient book is based on the guidelines written for doctors.

This book focuses on the treatment of pancreatic cancer. NCCN also offers patient books on breast cancer, lung cancer, melanoma, and many other cancer types. Visit [NCCN.org/patients](http://NCCN.org/patients) for the full library of patient books as well as other patient and caregiver resources.

# Credits

NCCN® aims to improve the care given to patients with cancer. NCCN staff work with experts to create helpful programs and resources for many stakeholders. Stakeholders include health providers, patients, businesses, and others. One resource is the series of books for patients called the NCCN Patient Guidelines®. Each book presents the best practice for a type of cancer.

The patient books are based on clinical practice guidelines written for cancer doctors. These guidelines are called the NCCN Guidelines®. Clinical practice guidelines list the best health care options for groups of patients. Many doctors use them to help plan cancer treatment for their patients.

Panels of experts create the NCCN Guidelines. Most of the experts are from the 25 NCCN Member Institutions. Panelists may include surgeons, radiation oncologists, medical oncologists, and patient advocates. Recommendations in the NCCN Guidelines are based on clinical trials and the experience of the panelists.

The NCCN Guidelines are updated at least once a year. When funded, the patient books are updated to reflect the most recent version of the NCCN Guidelines for doctors. For more information about the NCCN Guidelines, visit [NCCN.org/clinical.asp](http://NCCN.org/clinical.asp).

NCCN staff involved in creating the guidelines for patients and doctors include:

## **NCCN Patient Guidelines**

Dorothy A. Shead, MS  
*Director, Patient and Clinical  
Information Operations*

Laura J. Hanisch, PsyD  
*Medical Writer/  
Patient Information Specialist*

Lacey Marlow  
*Associate Medical Writer*

## **NCCN Guidelines**

Jennifer Burns  
*Guidelines Coordinator*

Deborah Freedman-Cass, PhD  
*Oncology Scientist/Senior Medical Writer*

## **NCCN Marketing**

Susan Kidney  
*Graphic Design Specialist*

## **NCCN Drugs & Biologics Programs**

Rachael Clarke  
*Medical Copyeditor*



## **Supported by the NCCN Foundation®**

The NCCN Foundation supports the mission of the National Comprehensive Cancer Network® (NCCN®) to improve the care of patients with cancer. One of its aims is to raise funds to create a library of books for patients. Learn more about the NCCN Foundation at [NCCN.org/foundation](http://NCCN.org/foundation).

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National Comprehensive Cancer Network (NCCN)  
275 Commerce Drive • Suite 300  
Fort Washington, PA 19034  
215.690.0300

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## Who should read this book?

This book is about treatment for cancer that starts in the ducts of the pancreas—called ductal adenocarcinoma. About 90 out of 100 people with pancreatic cancer have ductal adenocarcinoma. Patients and those who support them—caregivers, family, and friends—may find this book helpful. The information in this book may help you talk with your treatment team, understand what doctors say, and prepare for treatment.

## Does the whole book apply to me?

This book includes information for many situations. Thus, not everyone will get every test and treatment listed. Your treatment team can point out what applies to you and give you more information. As you read through this book, you may find it helpful to make a list of questions to ask your doctors.

This book includes the recommendations that NCCN experts agree are most useful for most patients. However, each patient is unique and these specific recommendations may not be

right for you. Your doctors may suggest other tests or treatments based on your health and other factors. This book does not replace the knowledge and suggestions of your doctors.

## Making sense of medical terms

In this book, many medical words are included that describe cancer, tests, and treatments. These are words that you will likely hear from your treatment team. Some of the information may be new to you, and it may be a lot to learn. Keep reading and review the information. Be sure to ask your treatment team to explain a word or phrase that you don't understand.

Words that you may not know are defined in the text or underlined when first used on a page. All underlined words are defined in the *Glossary*. Acronyms are also listed and defined in the *Glossary*. Acronyms are words formed from the first letters of other words. One example is CT for computed tomography.





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# About pancreatic cancer



# 1 About pancreatic cancer

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You've learned that you have pancreatic cancer. It's common to feel shocked and confused. Part 1 reviews some basics about pancreatic cancer that may help you better understand this disease. These basics may also help you start planning for treatment.

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## What is the pancreas?

The pancreas is a gland found behind the stomach. A gland is an organ that makes fluids or chemicals the body needs. The pancreas is about 6 inches long and has three main parts. The widest part is called the head. The middle part is called the body. The narrow end is called the tail.

The pancreas makes hormones, such as insulin. It also makes proteins, called enzymes, that help to digest food. Endocrine cells of the pancreas make hormones. Enzymes are made by exocrine cells in the small ducts of the pancreas. Ducts are tiny tubes or vessels that fluids pass through. The small ducts connect to the main pancreatic duct that extends from the tail to the head of the pancreas.

The liver is near the pancreas, above the gallbladder. The liver removes waste from blood and makes bile—a fluid that helps to digest food. The gallbladder stores bile from the liver. The common bile duct carries bile from the liver into the main pancreatic duct. From the main pancreatic duct, bile and enzymes empty into the duodenum. The duodenum is the first part of the small intestine, which absorbs nutrients from eaten food. **See Figure 1.**

## How does pancreatic cancer start?

Cancer is a disease of cells—the building blocks that form tissue in the body. Normal cells grow and then divide to make new cells. New cells are made as the body needs them. When normal cells grow old or get

damaged, they die. Cancer cells don't do this. Cancer cells make new cells that aren't needed and don't die quickly when old or damaged. [See Figure 2.](#) Over time, cancer cells grow and divide enough to form a primary tumor. Primary tumors can grow large and invade nearby tissues.

**Figure 1.**  
Pancreas and  
nearby organs

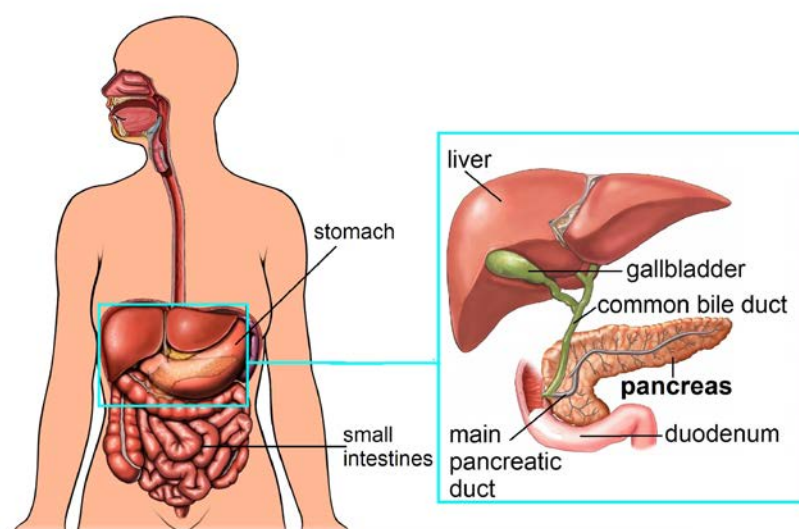


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**Figure 2.**  
Normal versus  
cancer cell growth

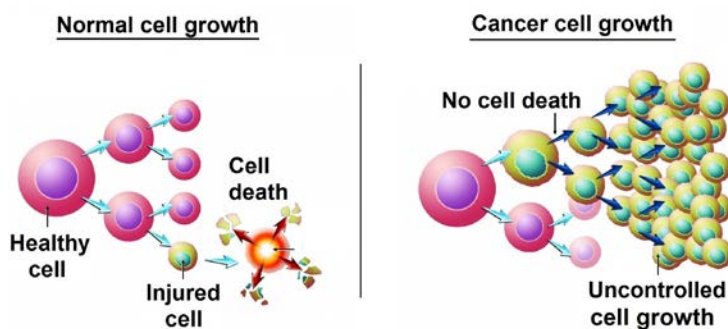


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Genes are instructions in cells for making new cells and controlling how cells behave. Changes in genes turn normal cells into cancer cells. Within the pancreas, exocrine or endocrine cells can become cancer cells. About 90 out of 100 pancreatic cancers start in exocrine cells that line the ducts of the pancreas. This type of pancreatic cancer is called ductal adenocarcinoma and is the focus of this patient book.

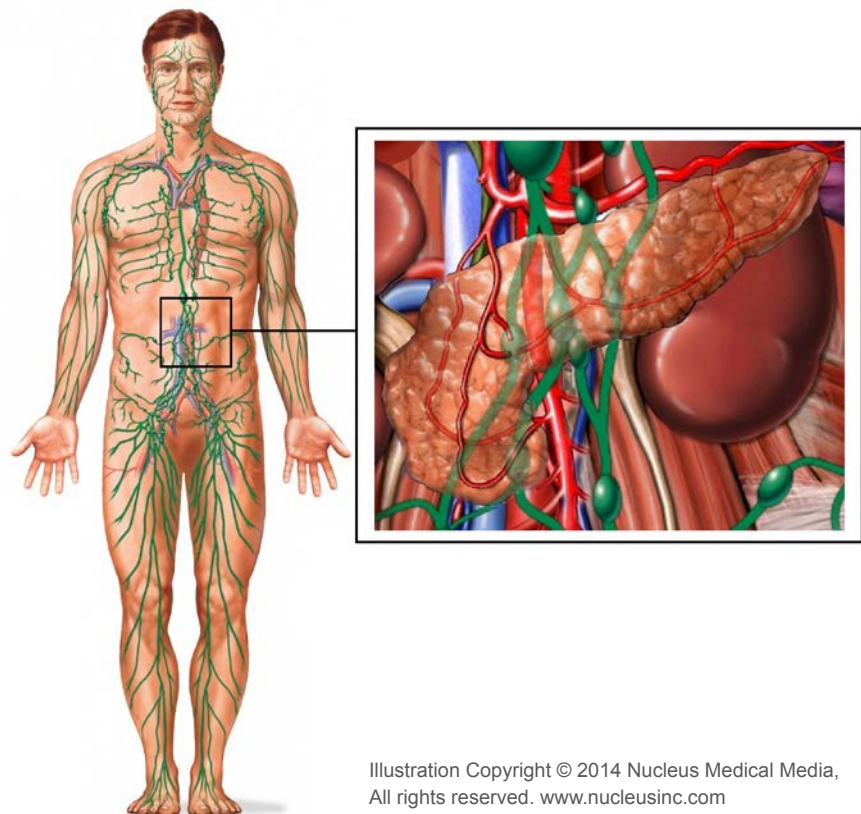
## How does pancreatic cancer spread?

Unlike normal cells, cancer cells can spread and form tumors in other parts of the body. The spread of cancer makes it dangerous. Cancer cells can invade normal tissue and cause organs to stop working.

Cancer that has spread is called a metastasis. Cancer that has spread to a nearby body part is called a local metastasis. Cancer that has spread to a body part far from the primary tumor is called a distant metastasis.

Cancer can spread to distant sites through blood. Two major blood vessels lie behind the pancreas. The superior mesenteric artery supplies the intestines with blood. The superior mesenteric vein returns blood to the heart.

Cancer can also spread through lymph. Lymph is a clear fluid that gives cells water and food. It also has white blood cells that fight germs. Lymph nodes filter lymph and remove the germs. Lymph travels throughout the body in vessels like blood does. Lymph vessels and nodes are found everywhere in the body. **See Figure 3.**



**Figure 3.**  
Lymph nodes and vessels

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## Websites

### American Cancer Society

[www.cancer.org/cancer/pancreaticcancer/detailedguide/pancreatic-cancer-what-is-pancreatic-cancer](http://www.cancer.org/cancer/pancreaticcancer/detailedguide/pancreatic-cancer-what-is-pancreatic-cancer)

### National Cancer Institute

[www.cancer.gov/cancertopics/pdq/treatment/pancreatic/Patient#Keypoint1](http://www.cancer.gov/cancertopics/pdq/treatment/pancreatic/Patient#Keypoint1)

### Pancreatic Cancer Action Network

[www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/what-is-the-pancreas/](http://www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/what-is-the-pancreas/)

[www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/types-of-pancreatic-cancer/](http://www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/types-of-pancreatic-cancer/)

## Review

- The pancreas helps digest food.
- Pancreatic cancer often starts in the cells that line the ducts.
- Cancer cells form a tumor since they don't die as they should.
- Cancer cells can spread to other body parts through lymph or blood.

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## My notes

[illegible]

# Tests for pancreatic cancer



## 2 Tests for pancreatic cancer

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Treatment planning starts with testing. This section describes the tests that are used to confirm (diagnose) pancreatic cancer and plan treatment. This information can help you use the *Treatment guide* in Part 5. It may also help you know what to expect during testing. Not every person with pancreatic cancer will receive every test listed.

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### General health tests

#### Medical history

Before and after cancer treatment, your doctor will assess your medical history. Your medical history includes any health events in your life and any medications you've taken. This information may affect which cancer treatment is best for you. It may help to make a list of old and new medications while at home to bring to your doctor's office. Since some health problems run in families, your doctor may want to ask about the medical history of your blood relatives.

#### Physical exam

Doctors often give a physical exam along with taking a medical history. A physical exam is a review of your body for signs of disease. During this exam, your doctor will listen to your lungs, heart, and gut. Parts of your body will likely be felt to see if organs are of normal size, are soft or hard, or cause pain when touched.

Your doctor will also check for jaundice. Jaundice is a yellowing of the skin and eyes due to a buildup



of bilirubin in the body. **See Figure 4.** Bilirubin is a yellow-brown substance in bile—a fluid made by the liver to help digest food. Bile flows out of the liver through bile ducts. A tumor in the pancreas can cause jaundice by blocking a bile duct.

## Imaging tests

Imaging tests allow your doctors to see inside your body. The images may show if there is a tumor in your pancreas as well as the tumor size and location. Imaging tests are often easy to undergo. Before the test, you may be asked to stop eating or drinking for several hours. You also should remove any metal objects that are on your body.

There is more than one type of imaging test for pancreatic cancer. Pictures (images) can be made with scanning machines or scoping tools.

### Scans / Imaging scans

Scanning machines are large and have a tunnel in the middle. During the test, you will need to lie on a table that moves slowly through the tunnel. Pillows or straps may be used to keep you still during the test. You will be alone, but a technician will operate the machine in a nearby room. He or she will be able to see, hear, and speak with you at all times.

As the machine takes pictures, you may hear buzzing, clicking, or whirring sounds. Earplugs are sometimes worn to block these sounds. A computer combines all pictures into one detailed picture. An imaging scan can take about 30 to 60 minutes to complete.

Often, there are no side effects. If radiation is used, the amount is small. You will likely be able to resume your activities right away unless you were given a sedative. The test results may not be ready for a few days since a radiologist needs to see the pictures. There is more than one type of imaging scan that may be used for pancreatic cancer. The types of imaging scans recommended for pancreatic cancer are described next.

**Figure 4. Jaundice of the eyes**



Cholangitis Jaundice by Bobjgalindo available at [http://commons.wikimedia.org/wiki/File:Cholangitis\\_Jaundice.jpg](http://commons.wikimedia.org/wiki/File:Cholangitis_Jaundice.jpg) under a Creative Commons Attribution-Share Alike 3.0 Unported license.



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### CT (computed tomography) scan

A CT scan is often the first test given for pancreatic cancer. A CT scan takes many pictures of a body part from different angles using x-rays. **See Figure 5.**

A special type of CT scan—called a pancreatic protocol CT scan—is recommended for pancreatic cancer. A protocol is a detailed plan of a medical study, treatment, or procedure. A pancreatic protocol CT is done in a certain way so that all of the pictures focus specifically on the pancreas and nearby area. This special CT scan allows doctors to clearly see the pancreas, nearby blood vessels, and very tiny tumors.

Before the CT scan, you may be given a contrast dye to make the pictures clearer. The dye will be injected into your vein. It may cause you to feel flushed or get

hives. Rarely, serious allergic reactions occur. Tell your doctor if you have had bad reactions before.

### MRI (magnetic resonance imaging) scan

An MRI scan uses radio waves and powerful magnets to take pictures of the inside of the body. It does not use x-rays. An MRI may cause your body to feel a bit warm. Like a CT scan, a contrast dye may be used to make the pictures clearer. A special type of MRI scan—called a pancreatic protocol MRI scan—is recommended for pancreatic cancer. A pancreatic protocol MRI scan is done in a certain way so that it focuses specifically on the pancreas and nearby area. This special MRI scan allows doctors to clearly see the pancreas, nearby blood vessels, and very tiny tumors. A pancreatic protocol MRI scan may be used instead of CT to view the pancreas.

### MRCP (magnetic resonance cholangiopancreatography)

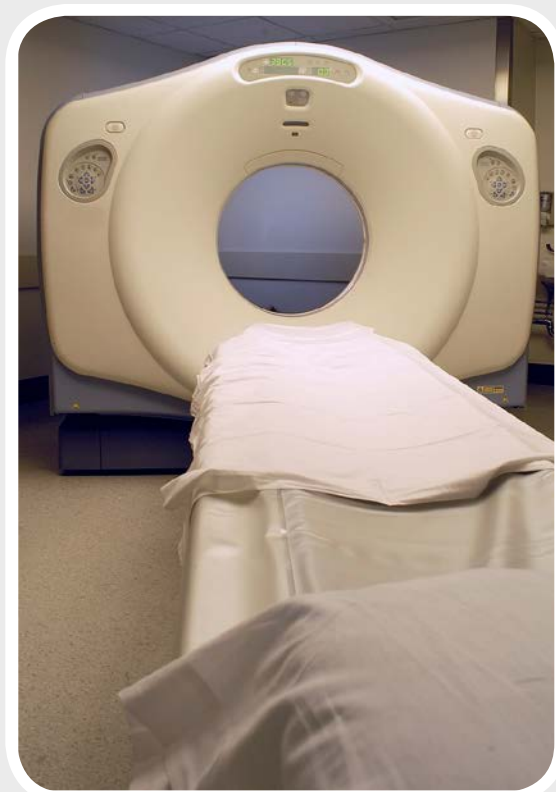
An MRCP is a type of MRI scan that makes very clear pictures of the pancreas and bile ducts. No contrast dye is used because bile and other fluids serve as contrast. An MRCP takes about 10 minutes, but it is often done along with a normal MRI scan.

### Scopes / Internal imaging

Some imaging tests use a thin, tube-shaped tool called a scope that is inserted into the body to take pictures. One end of the scope has a small light and camera lens to see inside your body. At the other end of the scope is an eyepiece that your doctor looks through to see the images shown by the camera. The scope may be guided into the body through a natural opening, such as the mouth or nose. Or, it may be inserted through a small surgical cut.

There is more than one type of scope that may be used for imaging tests. The type of scope often used for pancreatic cancer is called an endoscope. An endoscope is often guided into the body through the mouth. The types of imaging tests with scopes recommended for pancreatic cancer are described below.

**Figure 5. CT scanning machine**



### EUS (endoscopic ultrasound)

An EUS uses an endoscope that has a small ultrasound probe at the end. The endoscope is inserted through your mouth and guided down your throat and stomach to the first part of the small intestine (duodenum). The ultrasound probe bounces sound waves off your pancreas and other organs to make pictures of the inside of your body. EUS is often done to get a close look at your pancreas and any tumor that might be in it. EUS takes about 15 to 45 minutes. For this test, your doctor will first give you a sedative—medicine to make you feel relaxed or sleepy. After the test, your throat may feel sore and you may feel bloated.

### ERCP (endoscopic retrograde cholangiopancreatography)

An ERCP uses an endoscope and x-rays to make pictures of the inside of the body. For this test, the endoscope will be inserted through your mouth and guided down your throat and stomach to the duodenum. Next, a thinner tube called a catheter will be passed through the middle of the endoscope. The catheter will be used to inject a contrast dye into

the pancreatic and bile ducts. **See Figure 6.** Then, an x-ray machine will take pictures. The contrast dye allows the pancreatic and bile ducts to be clearly seen on the x-ray pictures. An ERCP takes about 30 to 90 minutes. For this test, your doctor will first give you a sedative—medicine to make you feel relaxed or sleepy. After the test, your throat may feel sore and you may feel bloated.

### Laparoscopy

This test is a type of surgery that allows your doctors to see organs in your belly area (abdomen). It uses a laparoscope—a tool like an endoscope. For this test, the laparoscope will be inserted through a tiny cut in your abdomen. Laparoscopy is done under general anesthesia—a controlled loss of wakefulness from drugs. It is done in an operating room and takes about 30 minutes. After the surgery, you may feel tired and may have some pain. You may also have a small scar after the cut has healed.

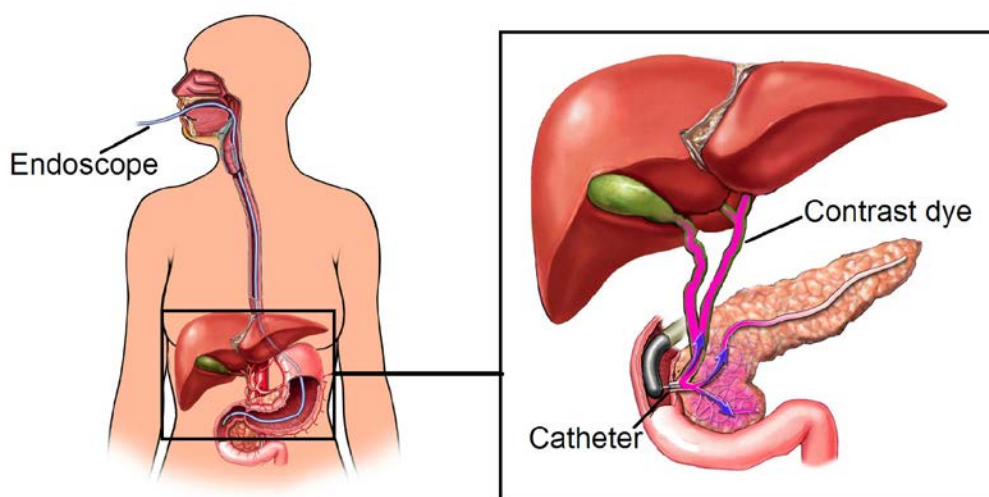


Figure 6. ERCP

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## Blood tests

Blood tests are used to check for signs of disease, how well organs are working, and treatment results. One common blood test is a complete blood cell count. This test counts the number of blood cells in a blood sample. Too few or too many cells may signal there's a problem.

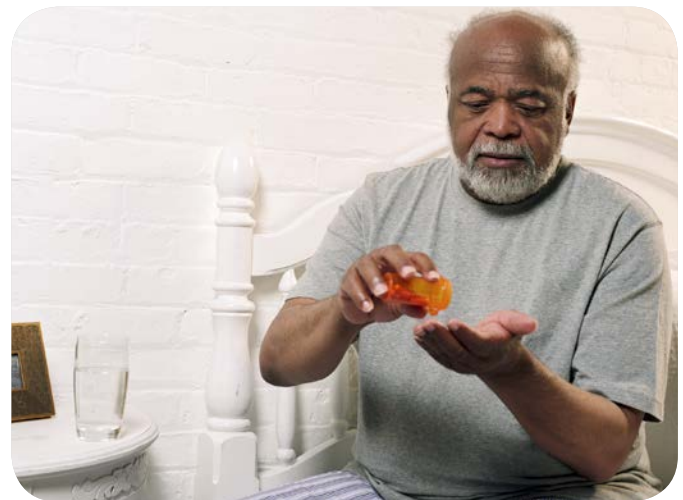
A blood chemistry test is another common type of blood test. This test measures the levels of different chemicals in the blood. Abnormal levels—too low or too high—can be caused by cancer or other diseases.

Liver function tests are a type of blood chemistry test often used for pancreatic cancer. The liver removes waste from the blood and releases fluids to help digest food. Liver function tests check for chemicals that are made or processed by the liver. Levels that are too high or low signal that the liver is not working well.

CA 19-9 is a substance found in blood that is often high in people with pancreatic cancer. High levels can be caused by pancreatic cancer or other health problems. A CA 19-9 blood test is used to check how well cancer treatment is working. This test is not used to confirm (diagnose) pancreatic cancer.

Bilirubin is a chemical that gives bile its color. Bile is fluid made by the liver to help digest food. Bile flows out of the liver through small tubes called bile ducts. There may be too much bilirubin in the blood if a tumor is blocking a bile duct. Too much bilirubin causes a yellowing of the eyes and skin—a condition called jaundice. It also increases the level of CA 19-9 in the blood.

Your doctor may change your treatment plan based on the results of blood tests. How many times your blood will be tested depends on the cancer treatments you receive and other factors. Common side effects of blood tests are bruising and dizziness.



## Tissue tests

Imaging tests may fail to show pancreatic cancer. Thus, your doctor may want you to have a biopsy. A biopsy is the removal of a small sample of tissue from the body for testing. The biopsy sample will be sent to a lab so a pathologist can examine it with a microscope for cancer cells. A pathologist is a doctor who's an expert in testing cells and tissues for disease. Lab tests often find cancer cells if any are present in the tissue sample. If no cancer cells are found, a biopsy sample may be taken from a different spot of the pancreas if your doctors still think there's cancer. There is more than one type of biopsy that may be used. The types of biopsies used for pancreatic cancer are described next.

### FNA biopsy

An FNA (**f**ine-**n**eedle **a**spiration) biopsy is the type of biopsy used most often to confirm pancreatic cancer. This type of biopsy uses a very thin needle to remove the tissue sample. There are two main ways to perform an FNA biopsy.

### EUS-FNA

An FNA biopsy can be done during EUS with a thin needle attached to the end of the endoscope. This is called an EUS-guided FNA biopsy or EUS-FNA. For this type of biopsy, the endoscope is passed through the mouth and throat down into your stomach. An ultrasound probe at the end of the endoscope

bounces sound waves off organs and tissues to make a picture of the inside of your body. Your doctor uses these pictures to guide the endoscope and needle to the right spot. Then the needle is inserted through your stomach or duodenum and into the tumor in your pancreas.

### CT-guided FNA

A second way to perform an FNA biopsy is to insert a thin needle through the skin and into the tumor using a CT scan for guidance. This is called a CT-guided FNA biopsy. The CT scan takes many pictures of a part of the body from different angles using x-rays. Your doctor will use the pictures from the CT scan to find the tumor in your pancreas and guide the needle to the right spot. For this type of biopsy you will be given local anesthesia—a loss of feeling in a small area of the body caused by drugs.

Besides FNA, a biopsy of the tumor may also be done during surgery or laparoscopy. During ERCP, samples may be removed from the pancreatic duct. In this case, the samples—called brushings—are removed with a small brush at the end of the endoscope.

A biopsy is often done in less than 1 hour. It is generally a safe test. Before a biopsy, you may be asked to stop eating, stop taking some medicines, or stop smoking. You may have some pain after a CT-guided FNA biopsy. After an EUS-FNA biopsy, your throat may be sore and you may feel bloated.





## Cancer staging

The cancer stage is a rating by your doctors of how far the cancer has grown and spread. Which treatment is best for you depends on how far the cancer has spread. There are two ways that may be used to stage or classify pancreatic cancer. The AJCC (**A**merican **J**oint **C**ommittee on **C**ancer) system groups pancreatic cancer into five stages (stage 0 – stage IV). The stages are defined by the growth of the primary tumor and its spread to other sites in the body. In the AJCC system, cancer may be staged twice—once based on tests before surgery and then based on tests of tissue removed during surgery. Some doctors use this staging system to plan treatment.

However, most NCCN doctors do not use the AJCC staging system. Rather, they classify pancreatic cancer and plan treatment based on the results of imaging and other tests done before surgery. In this system, doctors classify pancreatic cancer into four main groups: resectable, borderline resectable, locally advanced unresectable, and metastatic. Because this is the system most NCCN doctors use, recommendations in the *Treatment guide* in Part 5 are based on this system and its four groups of pancreatic cancer:

### Resectable

Cancer that has not spread outside the pancreas and appears to be easily treated with surgery.

### Borderline resectable

Cancer that is confined to the pancreas but approaches nearby structures or is accompanied by severe symptoms, raising concern that the cancer might not be resectable with clear margins.

### Locally advanced unresectable

Cancer that has spread outside the pancreas to nearby blood vessels or other tissues and cannot be treated with surgery.

### Metastatic

Cancer that has spread outside the pancreas to organs and tissues far away in the body.

## Questions about **testing** to ask your doctor

1. What tests will I have?
2. Do you recommend that I have a biopsy? If so, why?
3. Where will the tests take place? Will I have to go to the hospital?
4. How long will it take? Will I be awake?
5. Will it hurt? Will I need anesthesia?
6. What are the risks?
7. How do I prepare for testing? Should I bring someone with me?
8. How soon will I know the results and who will explain them to me?
9. If a biopsy is done, will I get a copy of the results?
10. Who will talk with me about the next steps? When?

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## Websites

### American Cancer Society

[www.cancer.org/Cancer/PancreaticCancer/DetailedGuide/pancreatic-cancer-diagnosis](http://www.cancer.org/Cancer/PancreaticCancer/DetailedGuide/pancreatic-cancer-diagnosis)

[www.cancer.org/cancer/pancreaticcancer/detailedguide/pancreatic-cancer-staging](http://www.cancer.org/cancer/pancreaticcancer/detailedguide/pancreatic-cancer-staging)

### National Cancer Institute

[www.cancer.gov/cancertopics/pdq/treatment/pancreatic/Patient#Keypoint5](http://www.cancer.gov/cancertopics/pdq/treatment/pancreatic/Patient#Keypoint5)

[www.cancer.gov/cancertopics/pdq/treatment/pancreatic/Patient/page2](http://www.cancer.gov/cancertopics/pdq/treatment/pancreatic/Patient/page2)

### Pancreatic Cancer Action Network

[www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/diagnosis/](http://www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/diagnosis/)

## Review

- Cancer tests are used to find cancer, plan treatment, and check how well treatment is working.
- Your health history and a body exam inform your doctor about your health.
- Blood tests check for signs of disease.
- Tests that take pictures of the inside of your body may show cancer.
- Tests of tissue or fluid removed from your body may find cancer.

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# Overview of cancer treatments



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There is more than one treatment for pancreatic cancer. The main types are described on the next pages. This information may help you to use the *Treatment guide* in Part 5. It may also help you know what to expect during treatment. Not every person with pancreatic cancer will receive every treatment listed.

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## Surgery

Surgery is an operation to remove or repair a part of the body. Sometimes, surgery can be used as the main treatment to remove pancreatic cancer. NCCN experts recommend that surgery for pancreatic cancer should only be done at a hospital that does more than 15 pancreatic surgeries each year. Hospitals that perform many pancreatic surgeries often have better results.

There are three types of surgery used for pancreatic cancer. The type of surgery you receive depends on where the tumor is in the pancreas. The goal of surgery is to remove all of the cancer. To do so, the tumor is removed along with some normal-looking tissue around its edge. The normal-looking tissue is called the surgical margin. A clear margin is when no cancer cells are found in the normal-looking tissue around the edge of the tumor. This is also referred to as a negative margin. A positive margin is when cancer cells are found in the normal-looking tissue.

## Order of treatments

Most people with pancreatic cancer will receive more than one type of treatment. When and why treatments are given can be hard to understand. Part 5 gives full details. Here, the terms that describe the order of treatments are explained.

### Neoadjuvant treatment

Treatment given to shrink the tumor before surgery.

### Primary treatment

The main treatment given to rid the body of cancer.

### First-line treatment

The first set of treatments given.

### Adjuvant treatment

Treatment given after primary treatment to kill any remaining cancer cells.

### Second-line treatment

The next set of treatments given after the first or previous treatments failed.

## Whipple procedure

The surgery for a tumor in the widest part (head) of the pancreas is called a pancreatoduodenectomy, also known as a Whipple procedure. This surgery removes the head of the pancreas, the gallbladder, duodenum, part of the bile duct, and often part of the stomach. Some of the lymph nodes near your pancreas are often removed to test for cancer cells. Once the cancer has been removed, your surgeons will connect your organs so you can digest food.

## Distal pancreatectomy

The surgery for a tumor in the middle part (body) or narrow end (tail) of the pancreas is called a distal pancreatectomy. This surgery removes the body and tail of the pancreas, some nearby lymph nodes, and sometimes, the spleen and its blood vessels.

## Total pancreatectomy

The surgery for cancer in a large portion of the pancreas is called a total pancreatectomy. This surgery removes the entire pancreas. It also removes the gallbladder, duodenum, part of the bile duct and stomach, nearby lymph nodes, and sometimes the spleen. This surgery is not done often.

## Radiation therapy

Radiation therapy uses high-energy rays to treat cancer. The rays damage a cell's instructions for making and controlling cells. This either kills the cancer cells or stops new cancer cells from being made. More research is needed to know the best practice for treating pancreatic cancer with radiation. This section explains the methods of radiation therapy that are currently used.

For pancreatic cancer, radiation is often given with chemotherapy. Chemotherapy may improve how well radiation works. This combined treatment is called chemoradiation.

### External radiation

For pancreatic cancer, radiation is often given using a machine outside the body. This method is called EBRT (**e**xternal **b**eam **r**adiation **t**herapy). For EBRT, your doctors will first take pictures of the tumor with a CT scan using contrast dye. This process is called simulation. Your doctors will use the pictures to help target the tumor and plan radiation treatment.

Using the CT scan pictures, your doctors will plan the radiation dose, number and shape of radiation beams, and number of treatment sessions. Beams are shaped with computer software and hardware added to the radiation machine.

During treatment, you will lie on a table in the same position as done during simulation. Devices may be used to keep you from moving so that the radiation

targets the tumor. Likewise, methods may be applied to control breathing. Radiation beams are aimed at the tumor with help from ink marks on the skin or tiny, gold seeds placed in the tumor.

You will be alone while the technician operates the machine from a nearby room. He or she will be able to see, hear, and speak with you at all times. As treatment is given, you may hear noises. A treatment session can take about 30 to 60 minutes. The types of EBRT used for pancreatic cancer include:

- **3D-CRT (three-dimensional conformal radiation therapy)** – Radiation is given in small doses for a few weeks with beams that match the shape of the tumor,
- **IMRT (intensity-modulated radiation therapy)** – Radiation is given in small doses for a few weeks with beams of different strengths based on the thickness of the tumor, and
- **SABR (stereotactic ablative radiotherapy)** – Radiation is given in high doses within a few visits and precisely targets the tumor.

### Internal radiation

The other radiation method is internal radiation therapy, also called brachytherapy. Internal radiation therapy involves placing a radioactive object in or near the tumor. For pancreatic cancer, internal radiation is given during surgery through a plastic tube that is removed before the surgical cuts are sewn closed.





## Side effects of treatment

Side effects are unplanned or unwanted physical or emotional conditions caused by cancer treatment. Each treatment for pancreatic cancer can cause side effects, but how your body will respond can't be fully known. You may have different side effects than someone else. Common side effects of pancreatic cancer treatments are listed to the right.

Controlling side effects is important for your quality of life. There are many ways to limit these problems. However, listing all the ways is beyond the scope of this book. In general, changes in behavior, diet, or medications may help. Don't wait to tell your treatment team about side effects. If you don't tell your treatment team, they may not know how you are feeling.

**Ask your treatment team for a full list of common and rare side effects of any treatment you may have.**

### Surgery

You may experience weakness, tiredness, and pain after the surgery. Other common side effects are difficulty digesting food, diabetes, leakage of pancreatic fluids, and surgical scars.

### Radiation therapy

Side effects of radiation therapy may not occur in the first few visits. Over time, you may have discomfort in your belly area (abdomen). Other common side effects are nausea, diarrhea, fatigue, and not feeling hungry.

### Chemotherapy

Side effects of chemotherapy depend on the drug, amount taken, length of treatment, and the person. In general, side effects are caused by the death of fast growing cells, which are found in the gut, mouth, and blood. As a result, common side effects include diarrhea, nausea, vomiting, mouth sores, tiredness or weakness, numbness or tingling in the hands or feet, skin and nail changes, hair loss, swelling, and not feeling hungry.

### Targeted therapy

Common side effects of erlotinib are skin rash, diarrhea, nausea, feeling tired, and not feeling hungry. The rash may appear on the face, neck, or trunk of the body within the first 2 weeks of treatment.

## Chemotherapy

Chemotherapy is the use of drugs to treat cancer. Many people refer to this treatment as “chemo.” Chemotherapy kills fast-growing cells throughout the body, including cancer cells and normal cells. The chemotherapy drugs used for pancreatic cancer are listed in [Chart 1](#) below.

When only one drug is used, it is called a single agent. However, chemotherapy drugs differ in the way they work, so often more than one drug is used. A combination regimen is the use of two or more chemotherapy drugs. Leucovorin (also called folinic acid) is sometimes given along with 5-FU (5-fluorouracil) to improve how well the chemotherapy works. One example of a combination regimen used for pancreatic cancer is FOLFIRINOX (folinic acid, 5-fluorouracil, irinotecan, oxaliplatin). Often, combination regimens are referred to by the

main chemotherapy drug used. For gemcitabine-based combination therapy, the main drug used is gemcitabine. For fluoropyrimidine-based therapy, the main drug used is 5-FU.

Chemotherapy for pancreatic cancer can be given as a pill taken by mouth or as a liquid that is slowly injected into a vein. Most of the chemotherapy drugs listed in [Chart 1](#) are given as injections. How long it takes to give the chemotherapy injection depends on which chemotherapy you receive.

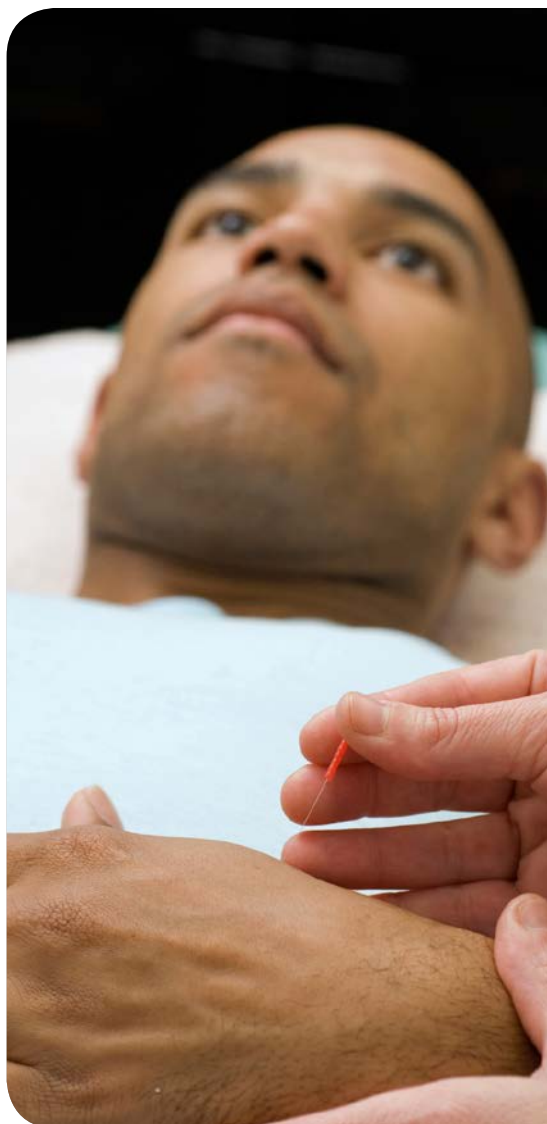
Chemotherapy is given in cycles of treatment days followed by days of rest. These cycles vary in length depending on which drugs are used. Often, the cycles are 14, 21, or 28 days long. These cycles give the body a chance to recover before the next treatment. Thus, chemotherapy treatment includes some days without treatment.

**Chart 1. Chemotherapy for pancreatic cancer**

Generic name	Brand name (sold as)
Capecitabine	Xeloda
Cisplatin	Platinol
Docetaxel	Taxotere
5-FU	—
Gemcitabine	Gemzar
Irinotecan	Camptosar
Oxaliplatin	Eloxatin
Nab-paclitaxel	Abraxane

## Targeted therapy

Targeted therapy is the use of drugs to treat cancer. Targeted therapy drugs target a specific or unique feature of cancer cells not generally present in normal cells. Because these drugs specifically target cancer cells, they may be less likely to harm normal cells throughout your body. Erlotinib is a targeted therapy used for pancreatic cancer. It treats cancer by blocking signals sent from the edge of a cancer cell that tell the cell to grow. Erlotinib is used with chemotherapy to treat pancreatic cancer. It is a pill that is taken by mouth and swallowed. It then travels in the bloodstream to treat cancer throughout the body.



## Complementary and alternative medicine

You may hear about other treatments from your family and friends. They may suggest using CAM (complementary and alternative medicine). CAM is a group of treatments that aren't often given by doctors. There is much interest today in CAM for cancer. Many CAMs are being studied to see if they are truly helpful.

Complementary medicines are treatments given along with usual medical treatments. While CAMs aren't known to kill cancer cells, they may improve your comfort and well-being. Two examples are acupuncture for pain management and yoga for relaxation.

Alternative medicine is used in place of usual medicine. Some alternative medicines are sold as cures even though they haven't been proven to work. If there was good proof that CAMs or other treatments cured cancer, they would be included in this booklet.

It is important to tell your treatment team if you are using any CAMs. They can tell you which CAMs may be helpful and which CAMs may limit how well treatments work.

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## Clinical trials

A clinical trial is a type of research that studies a test or treatment. Because of clinical trials, the tests and treatments in this book are now widely used to help patients.

Tests and treatments aren't offered to all patients as soon as they're made. They must be tested in clinical trials first. When tests and treatments are found to be safe and helpful, they may become tomorrow's standard of care. However, there is no way to know this before the trial is done.

Clinical trials are an important treatment option for people with pancreatic cancer. Until recently, not many clinical trials had been done to find tests and treatments for pancreatic cancer. Thus, doctors are still studying what tests and treatments work best. NCCN experts recommend that you talk with your treatment team about joining a clinical trial.

Clinical trials can study many things, such as:

- New drugs not yet approved by the FDA (**F**ood and **D**rug **A**dministration),
- New uses of drugs already approved by the FDA,
- New ways to give drugs, such as in pill form,
- New tests to find and track disease, and
- Drugs or procedures that relieve symptoms.

New clinical trials for pancreatic cancer aim to study:

- Better ways to identify who is at risk for pancreatic cancer,
- Early signs of pancreatic cancer so it can be cured,
- Better ways to image pancreatic cancers,
- New systemic therapy drugs to treat pancreatic cancer,

- New methods of giving radiation therapy,
- Which treatments work best to shrink a tumor for surgery, and
- Which treatments work best to kill cancer cells after surgery.

Clinical trials are done in a series of steps, called phases. This is to fully study how safe and helpful a test or treatment is for patients. The four phases of clinical trials are described next using the example of a new drug treatment:

**Phase I trials** aim to find the best dose and way to give a new drug with the fewest side effects. If a drug is found to be safe, it will be studied in a phase II trial.

**Phase II trials** assess if a drug works for a specific type of cancer. They are done in larger groups of patients with the same type of cancer.

**Phase III trials** compare a new drug to the standard treatment. These are randomized, meaning patients are put in a treatment group by chance.

**Phase IV trials** test new drugs approved by the FDA to learn about short-term and long-term side effects and safety. They involve many patients with different types of cancer.

There may be an open clinical trial that you can join. To join a clinical trial, you must meet the conditions of the study. Patients in a clinical trial often have a similar cancer type and general health. This helps ensure that any response is because of the treatment and not because of differences between patients. You also must review and sign a paper called an informed consent form to join a clinical trial. This form describes the study in detail, including the risks and benefits.



## Questions about **treatment** to ask your doctor

1. Are there any clinical trials that are appropriate for me?
2. What are the available treatments for pancreatic cancer?
3. What are the risks and benefits for each treatment of pancreatic cancer?
4. Will my age, general health, stage of pancreatic cancer, and other medical conditions limit my treatment choices?
5. Do I have to get treated?
6. Where will I be treated? Will I have to stay in the hospital or can I go home after each treatment?
7. What can I do to prepare for treatment? Should I stop taking my medications? Should I store my blood in case I need a transfusion?
8. How many pancreatic cancer surgeries have you done? How many of your patients have had complications?
9. Is pancreatic cancer surgery a major part of your practice?
10. How soon should I start treatment? How long does treatment take?
11. How much will the treatment cost? How can I find out how much my insurance company will cover?
12. How likely is it that I'll be cancer-free after treatment?
13. What symptoms should I look out for while being treated for pancreatic cancer?
14. When will I be able to return to my normal activities?
15. What is the chance that my cancer will come back and/or spread?
16. What should I do after I finish treatment?
17. Are there supportive services that I can get involved in? Support groups?

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## Questions about **clinical trials** to ask your doctor

1. Is there a clinical trial that I could take part in?
2. What is the purpose of the study?
3. What kinds of tests and treatments does the study involve?
4. What does the treatment do?
5. Has the treatment been used before? Has it been used for other types of cancers?
6. Will I know which treatment I receive?
7. What is likely to happen to me with, or without, this new treatment?
8. What are my other choices? What are their benefits and risks?
9. How might the study change my daily life?
10. What side effects can I expect from the study? Can the side effects be controlled?
11. Will I have to stay in the hospital? If so, how often and for how long?
12. Will the study cost me anything? Will any of the treatment be free?
13. If I'm harmed as a result of the research, what treatment might I get?
14. What type of long-term follow-up care is part of the study?

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## Websites

### American Cancer Society

[www.cancer.org/cancer/pancreaticcancer/detailedguide/pancreatic-cancer-treating-general-info](http://www.cancer.org/cancer/pancreaticcancer/detailedguide/pancreatic-cancer-treating-general-info)

[www.cancer.org/treatment/treatmentsandsideeffects/guidetocancerdrugs/index](http://www.cancer.org/treatment/treatmentsandsideeffects/guidetocancerdrugs/index)

### National Cancer Institute

[www.cancer.gov/cancertopics/pdq/treatment/pancreatic/Patient/page4](http://www.cancer.gov/cancertopics/pdq/treatment/pancreatic/Patient/page4)

[www.cancer.gov/clinicaltrials](http://www.cancer.gov/clinicaltrials)

### Pancreatic Cancer Action Network

[www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/treatment/](http://www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/treatment/)

[www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/clinical-trials/](http://www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/clinical-trials/)

### NCCN

[www.youtube.com/playlist?list=PL3A7433A9A0F7A0A6](https://www.youtube.com/playlist?list=PL3A7433A9A0F7A0A6)

## Review

- Surgery removes the tumor along with some normal-looking tissue around its edge.
- Radiation kills cancer cells or stops new cancer cells from being made.
- Drugs can be used to kill cancer cells anywhere in the body.
- Chemotherapy drugs kill fast-growing cells, including cancer cells and normal cells.
- Targeted therapy drugs specifically target cancer cells.
- A clinical trial studies a test or treatment to see how safe it is and how well it works.
- Clinical trials are an important treatment option for people with pancreatic cancer.

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## My notes

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# Supportive care



# 4 Supportive care

36	Blocked bile duct
37	Blocked stomach
37	Pain
37	Malnutrition or trouble eating
38	Websites   Review



Supportive care is treatment given to relieve the health conditions caused by pancreatic cancer or cancer treatment. This is also referred to as palliative care. Supportive care is an important part of overall pancreatic cancer treatment. As pancreatic cancer grows, it can cause serious health problems such as pain, blockage, and difficulty eating. It is important to know about these health issues and talk to your treatment team to get the support you need. This section explains some of the main challenges you may face and the recommended supportive care for each.

## Blocked bile duct

A tumor in the pancreas may grow large enough to block your bile duct. A bile duct is a small tube that drains digestive fluid (bile) from the liver. The common bile duct carries bile from the liver through the pancreas and to the first part of the small intestine (duodenum). A blocked duct causes bile to build up in the liver. As a result, you may have pain, itching, discomfort, and jaundice—a yellowing of the eyes and skin.

A blocked bile duct may be treated by placing a biliary stent or doing a biliary bypass. A biliary stent is a tiny tube that is placed in the bile duct to unblock it or keep it open. Before the stent can be placed, bile may need to be drained through an opening in the side of the body. However, you may need a new or second stent during or after cancer treatment if the tumor grows larger. A bypass is a surgery to re-route the flow of fluids in the body. A biliary bypass is a surgery to re-route the flow of bile from the common bile duct into the small intestine. The result is that the bile flow avoids (bypasses) the blocked part of the duct.

## Blocked stomach

A tumor in the pancreas may also grow large enough to block eaten food from passing out of your stomach through the first part of the small intestine (duodenum). This blockage can cause pain, vomiting, and other problems. Treatments for a blocked stomach include a stent, a PEG (percutaneous endoscopic gastrostomy) tube, or a duodenal bypass.

A stent is an expandable tube that is placed in the duodenum to unblock it and keep it open. A PEG tube is a tube that is inserted through a cut in the abdomen and placed in the stomach to give food. A duodenal bypass is a surgery to re-route the path eaten food takes from the stomach into the small intestine. The result is that the path out of the stomach avoids (bypasses) the blocked part of the duodenum. This surgery may also be done as a preventive measure if there is a high risk that your stomach may become blocked.

## Pain

You may have pain caused by the cancer. Pain can occur when the tumor grows into nearby nerves or presses against other organs. Pain is often treated with drugs that are in pill form. Another treatment is to inject alcohol (ethanol) into nerves around the pancreas to destroy them. This treatment is called a nerve block. Destroying the nerves reduces pain. For certain patients with severe pain who haven't had radiation therapy as part of cancer treatment, there is a third option. In this case, your doctor may consider radiation therapy with or without chemotherapy to help relieve the pain by shrinking the tumor.

## Malnutrition or trouble eating

Healthy eating is always important. It includes eating a balanced diet, eating the right amount, and drinking enough fluids. Pancreatic cancer or its treatment may make healthy eating a challenge by causing you to feel not hungry, have abdominal cramps, or have trouble digesting food. A nutritionist—an expert in nutrition and food—can help.

You may also need drugs for diabetes—a disease that causes high levels of sugar in the blood. Or, you may need digestive enzymes because your pancreas has been removed or isn't working well because of the tumor. Digestive enzymes are proteins that help to break down (digest) eaten food for the body.

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## Websites

### American Cancer Society

[www.cancer.org/cancer/pancreaticcancer/detailedguide/pancreatic-cancer-treating-pain-control](http://www.cancer.org/cancer/pancreaticcancer/detailedguide/pancreatic-cancer-treating-pain-control)

[www.cancer.org/cancer/pancreaticcancer/overviewguide/pancreatic-cancer-overview-treating-surgery](http://www.cancer.org/cancer/pancreaticcancer/overviewguide/pancreatic-cancer-overview-treating-surgery)

### National Cancer Institute

[www.cancer.gov/cancertopics/wyntk/pancreas/page11](http://www.cancer.gov/cancertopics/wyntk/pancreas/page11)

[www.cancer.gov/cancertopics/wyntk/pancreas/page10](http://www.cancer.gov/cancertopics/wyntk/pancreas/page10)

### Pancreatic Cancer Action Network

[www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/treatment/surgery/biliary-and-gastric-bypass/](http://www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/treatment/surgery/biliary-and-gastric-bypass/)

[www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/treatment/surgery/stents/](http://www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/treatment/surgery/stents/)

### NCCN

[www.youtube.com/playlist?list=PL3A7433A9A0F7A0A6](https://www.youtube.com/playlist?list=PL3A7433A9A0F7A0A6)

## Review

- Supportive care—also called palliative care—is treatment for the health conditions caused by pancreatic cancer and its treatment.
- A stent is a tiny tube that may be used to unblock a bile duct or the stomach.
- Pain may be treated with medication, a nerve block, or radiation with or without chemotherapy.
- An expert in food and nutrition—called a nutritionist—can help if pancreatic cancer or its treatment make it hard for you to eat or digest food.

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# Treatment guide



# 5 Treatment guide

## 42 **5.1 Pancreatic cancer testing**

Presents the first set of tests that are recommended to confirm pancreatic cancer and plan treatment.

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## 46 **5.2 Resectable**

Presents the recommended treatment for cancer that hasn't grown beyond the pancreas and can be removed with surgery.

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## 52 **5.3 Borderline resectable**

Presents the recommended treatment for cancer that is confined to the pancreas but approaches nearby structures or has severe symptoms so that it might not be possible to remove by surgery.

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## 62 **5.4 Locally advanced unresectable**

Presents the recommended treatment for cancer that has spread outside the pancreas to nearby blood vessels or other tissues and can't be removed with surgery.

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## 68 **5.5 Metastatic**

Presents the recommended treatment for cancer that has spread far from the pancreas.

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**NCCN experts recommend that decisions about the diagnosis and treatment of pancreatic cancer should be made by a team of experts with experience in pancreatic cancer.**

Part 5 is a guide through the treatment options for people with pancreatic cancer.

It shows what tests and treatments are recommended under which conditions. This information is taken from the treatment guidelines written by NCCN experts for pancreatic cancer doctors.

The treatment recommendations in this guide are organized by cancer stage. The cancer stage is a rating by your doctor of how far the pancreatic cancer has grown and spread in your body. Pancreatic cancer staging is described on page 20.

Much effort has been made to make this guide easy to read. Charts list the treatment options and map the steps through the treatment process. The text along with each chart explains the information presented in the chart. Some words that you may not know are defined on the page and in the *Dictionary* on page 80. More information about the tests and treatments in this guide can be found in Parts 2 through 4.

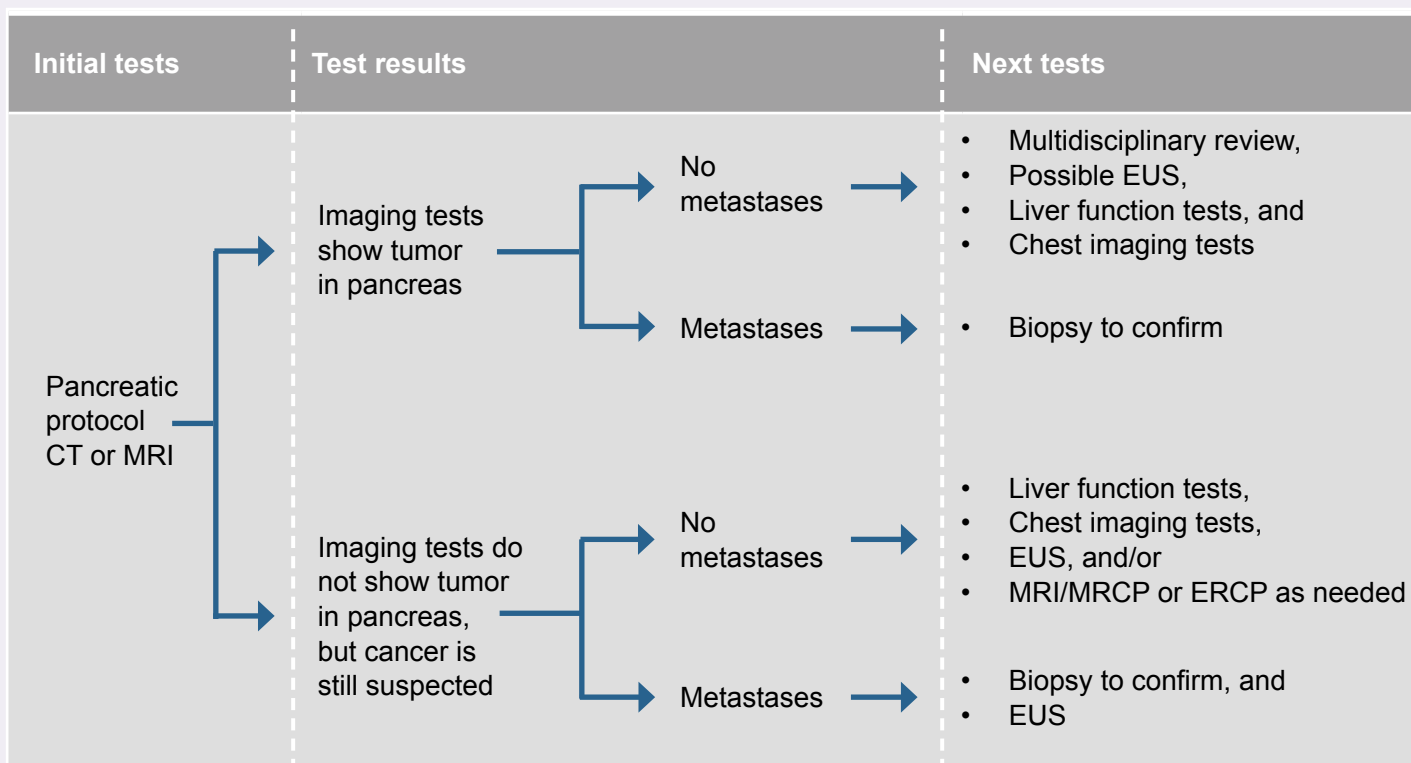


## 5.1 Pancreatic cancer testing

Part 5.1 describes the tests that are recommended to confirm (diagnose) pancreatic cancer and see how far it has spread. The extent of the cancer affects which treatment is best for you.

For pancreatic cancer, imaging tests are used to determine the extent of cancer. Imaging tests take pictures of the inside of the body.

**Chart 5.1.1 Tests to confirm pancreatic cancer**



**Chart 5.1.1** shows the initial tests that are recommended for pancreatic cancer. Testing is started when signs of pancreatic cancer are found by your doctors.

### Initial tests

The first test recommended to check for pancreatic cancer is a special type of CT or MRI scan called a

pancreatic protocol. A pancreatic protocol scan is done in a special way so that it specifically focuses on the pancreas. It allows doctors to clearly see the pancreas, nearby blood vessels, and very tiny tumors. The pictures made by these tests may show if there is a tumor in your pancreas. (Read Part 2 on page 14 for more details on CT and MRI.) The next tests recommended depend on whether or not the initial imaging tests show a tumor in your pancreas.

**If the initial CT or MRI scan shows a tumor in your pancreas,** then your doctor will give a few more tests to plan treatment. If there are no signs of metastases (cancer that has spread far outside your pancreas), then you may have an EUS so your doctor can get a clearer view of your pancreas and see how far the cancer has spread. You will also have blood tests to check if your liver is working well and imaging tests of your chest. (Read Part 2 on page 14 for more test details.) A team of doctors who are experts in different areas of cancer care should review the test results and plan treatment. This is called a multidisciplinary review. It should be done by experts such as a radiologist, pathologist, surgeon, medical oncologist, and radiation oncologist. If there are signs of metastases, then your doctor will remove a sample of the tumor to test for cancer cells. This is called a biopsy.

Next steps: ➡

If no metastases were found, see Chart 5.1.2 for recommended follow-up tests. If metastases were found, see Part 5.5 on page 68 for metastatic cancer treatment recommendations.

[illegible]

**Chart 5.1.2. Pre-surgical evaluation**

Symptoms	Symptom control	Tests
No jaundice		CA 19-9
Jaundice + symptoms of cholangitis or fever	<ul style="list-style-type: none"> <li>• Short metal stent, and</li> <li>• Antibiotics</li> </ul>	CA 19-9

**Chart 5.1.2** shows the next steps that are recommended when initial tests show no signs of cancer outside the pancreas. When cancer is only in the pancreas, surgery may be a treatment option. When deciding if surgery is possible, it is recommended that doctors consult a multidisciplinary team of experts at a hospital that does more than 15 pancreatic cancer surgeries each year. The tests in the chart above will help your doctor decide if surgery is a good option for you. But first, your doctors will treat any symptoms of cancer you may have.

## Tests

CA 19-9 is a substance found in blood. Pancreatic cancer can cause high levels of CA 19-9 in the blood. Thus, a CA 19-9 blood test is recommended before surgery to check for signs of advanced cancer.

## Symptoms

CA 19-9 levels are also high when there is too much bilirubin in the blood. Bilirubin is a yellow-brown

substance removed from blood by the liver. It drains out of the liver through tiny tubes called bile ducts. If a bile duct is blocked, then bilirubin will build up in the blood. Too much bilirubin in the blood causes jaundice—a yellowing of the eyes and skin. You may have jaundice because a tumor has blocked a bile duct. In this case, your doctors should wait to test your CA 19-9 levels, because they won't know if the high CA 19-9 level is being caused by cancer or bilirubin.

## Symptom control

**If you have jaundice** and symptoms of cholangitis or fever, then your doctors will place a stent in the bile duct to unblock it. You will be given antibiotic drugs along with the stent. Your doctor may also place a stent if you are very itchy from jaundice or won't have surgery within a week. If bilirubin levels return to normal before surgery, a CA 19-9 test can be done.

Based on the results of the tests in Chart 5.1.1 and Chart 5.1.2, your doctors will decide if the



cancer can be removed by surgery. Cancer that is only in the pancreas and appears to be easily removed by surgery is called resectable pancreatic cancer. Cancer that is confined to the pancreas but approaches nearby structures or has severe symptoms so that it's unclear if it can be completely removed by surgery is called borderline resectable pancreatic cancer. Cancer that has spread outside the pancreas to nearby blood vessels or other tissues and can't be removed by surgery is called locally advanced unresectable pancreatic cancer.



Next steps: ➡

For resectable pancreatic cancer, see Part 5.2 for treatment recommendations. For borderline resectable pancreatic cancer, see Part 5.3 for treatment recommendations. For locally advanced unresectable pancreatic cancer, see Part 5.4 for treatment recommendations.

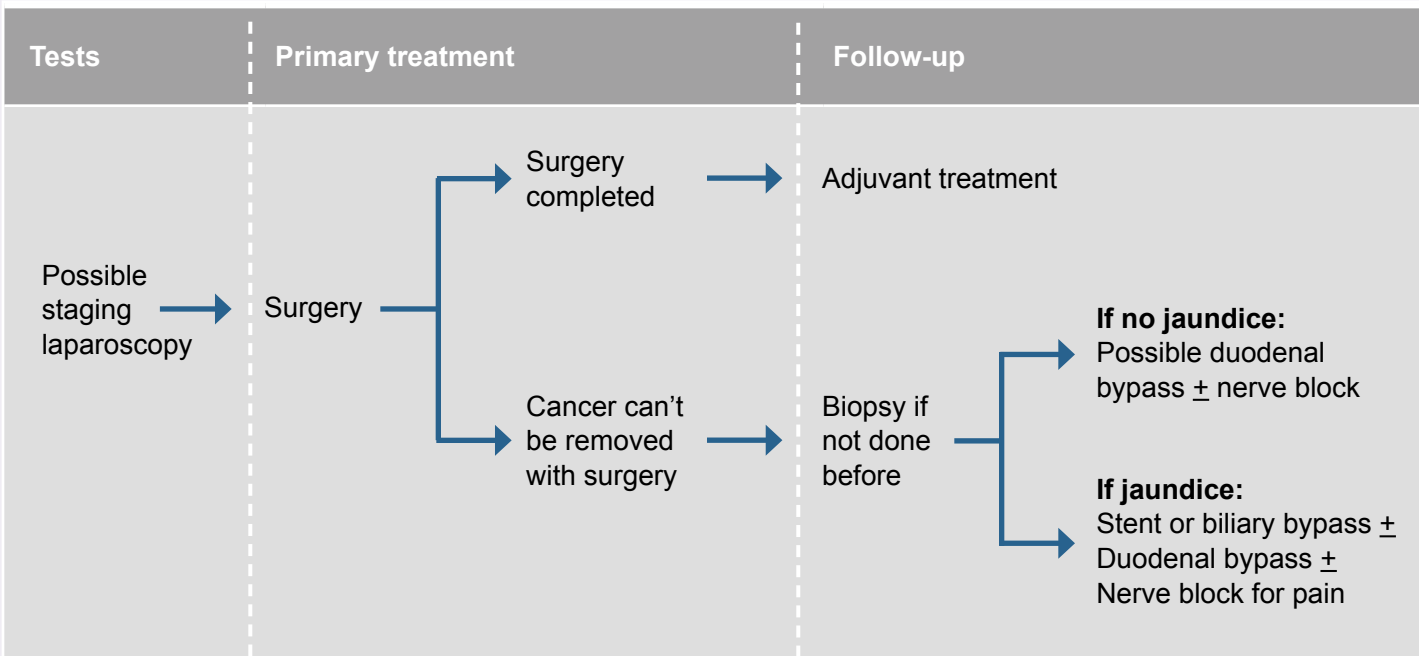
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5.2 Resectable pancreatic cancer

Part 5.2 describes the tests and treatments that are recommended for cancer that is only in the pancreas. This is called local pancreatic cancer and it can be removed by surgery. Cancer that can be removed by surgery is referred to as “resectable.” Cancer

that can’t be removed by surgery is referred to as “unresectable.” Surgery is only recommended if it’s very likely that all the cancer can be removed with no cancer cells left behind.

Chart 5.2.1 Primary treatment with surgery



**Chart 5.2.1** shows the recommended treatments for cancer that is in the pancreas only. Primary treatment is the first or main treatment used to rid your body of cancer. Surgery is the primary treatment for local pancreatic cancer that does not involve nearby blood vessels.

Tests

Before surgery to remove the cancer, your doctors may want to do a surgical test called a staging laparoscopy. It is used to see how far the cancer has spread and to confirm if all the cancer can be removed by surgery. Laparoscopy may find cancer that was not found by other tests. Your doctors may consider this test if you are at higher risk of having

metastases—cancer that has spread far from the first tumor in the pancreas. If your doctors think all the cancer can be removed, then you will have surgery.

## Primary treatment and follow-up

The type of surgery you will have depends on the size and location of the tumor. Read Part 3 on page 24 for details about each type of surgery for pancreatic cancer. NCCN experts recommend that surgery for pancreatic cancer should only be done at a hospital that does more than 15 pancreatic surgeries each year. Hospitals that perform many pancreatic surgeries often have better results.

**If all of the cancer can be removed**, then the surgery will be completed. After completing surgery, you will have more treatment to try to kill any remaining cancer cells. This is called adjuvant treatment. See *Next steps* at the end of this section.

**At the start of the surgery, your doctors may find that the cancer has spread too much and can't be removed by surgery.** At this time, you will have a biopsy to confirm pancreatic cancer if not done previously. The next recommendations depend on whether or not you have jaundice. Jaundice is a yellowing of the eyes and skin due to a buildup of bilirubin in the body. Bilirubin is a yellow-brown substance in bile—fluid made by the liver to help digest food. A tumor in the pancreas can cause jaundice by blocking a duct that drains bile from the liver.

If you do not have jaundice, your doctor may want to do a surgery to re-route the path between the stomach and duodenum, the first part of the small intestine. This is called a duodenal bypass and it may be done if cancer is blocking the stomach. If you have severe pain, your doctor may inject alcohol (ethanol) into the nerves near the pancreas to destroy them to

relieve the pain. This is called a nerve block.

If you have jaundice, then your doctor may place a stent in the bile duct to unblock it. Or, your doctor may do a surgery to re-route the flow of bile around the blocked part of the bile duct. This is called a biliary bypass. In addition, you may have a duodenal bypass or nerve block as described above.

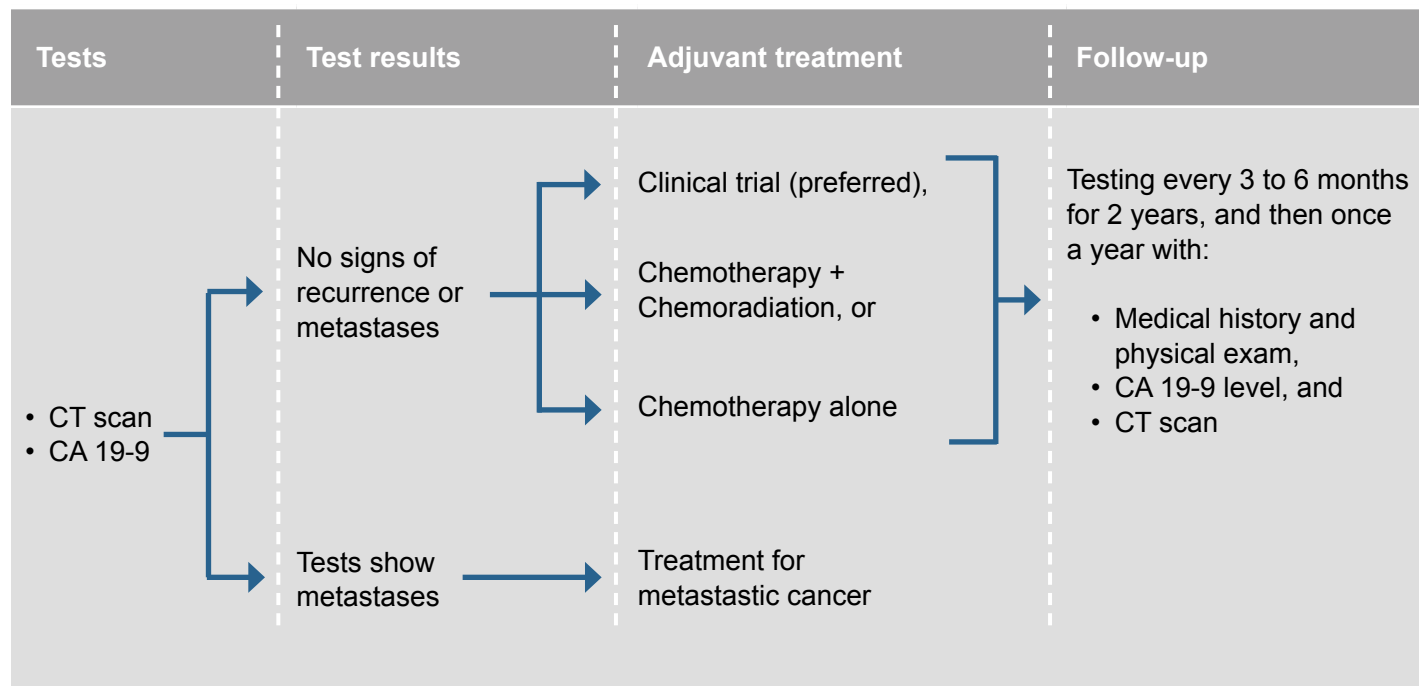
For cancer that couldn't be removed by surgery, the next treatments depend on how far the cancer has spread. Cancer that has spread outside the pancreas to nearby blood vessels or other tissues is called locally advanced unresectable. Cancer that has spread outside the pancreas to far sites in the body is called metastatic.

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### Next steps:

If surgery was completed, see [Chart 5.2.2 for adjuvant treatment recommendations](#). If surgery wasn't completed, see [Part 5.4 for treatments that are recommended for locally advanced unresectable pancreatic cancer](#) or [Part 5.5 for treatments that are recommended for metastatic pancreatic cancer](#).

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**Chart 5.2.2 Adjuvant treatment after surgery**

Options for chemotherapy given before or after chemoradiation:

- Gemcitabine,
- 5-FU/leucovorin, or
- Continuous infusion 5-FU

Options for chemotherapy alone:

- Gemcitabine,
- 5-FU/leucovorin,
- Continuous infusion 5-FU, or
- Capecitabine

**Chart 5.2.2** shows the next tests and treatments that are recommended after primary treatment with surgery for resectable pancreatic cancer. Primary treatment is the first or main treatment given to rid the body of cancer. Adjuvant treatment is treatment given after primary treatment to kill any remaining cancer cells.

## Tests

Before beginning adjuvant treatment, you will have a CT scan and CA 19-9 blood test. These tests are done to check for signs of recurrence—the return

of cancer after treatment. They also check for metastases—cancer that has spread outside the pancreas to far sites in the body. Read Part 2 on page 14 for more test details.

## Test results

**If the tests show metastases**, then adjuvant treatment is not recommended. Instead, you will receive treatment for metastatic pancreatic cancer. See *Next steps* at the end of this section.

**If the tests do not show any signs of recurrence or metastases**, then you will receive adjuvant treatment. Adjuvant treatment should only be started after you've fully recovered from surgery. Starting 4 to 8 weeks after surgery is ideal.

## Adjuvant treatment

There are 3 main options for adjuvant treatment. Taking part in a clinical trial is strongly recommended and is the preferred option for adjuvant treatment. A clinical trial is a type of research that studies the safety and effectiveness of a test or treatment. Read Part 3 on page 30 for more details on clinical trials.

If you aren't able to join a clinical trial, another option is to receive chemotherapy and chemoradiation. In this case, chemotherapy may be given before or after chemoradiation. Another CT scan is recommended after chemotherapy if it will be followed by chemoradiation. Recommended chemotherapy drugs include gemcitabine, 5-FU with leucovorin, or continuous infusion 5-FU. Chemoradiation may be fluoropyrimidine-based or gemcitabine-based. Read Part 3 on page 24 for details on each treatment.

The third option is to receive chemotherapy only. In this case, chemotherapy drug options include gemcitabine, 5-FU with leucovorin, continuous infusion 5-FU, or capecitabine. Gemcitabine is preferred because its side effects aren't as severe as 5-FU/leucovorin. Capecitabine is suggested as a last choice only when other options cannot be used.

## Follow-up

After completing adjuvant treatment, you will have follow-up tests. Follow-up tests are tests given after treatment to check how well treatment worked. These tests look for signs of cancer return (recurrence) or spread (metastasis) after treatment.

Follow-up tests are recommended every 3 to 6 months for 2 years, and then once every year. A medical history and physical exam can help to find signs and symptoms of pancreatic cancer early. CA 19-9 is a substance found in blood and high levels can be caused by pancreatic cancer. Thus, a CA 19-9 blood test is recommended as part of follow-up testing. A CT scan is also recommended to look for early signs of cancer recurrence. Read Part 2 on page 14 for details.

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Next steps: 

After completing adjuvant treatment, if follow-up tests show a recurrence, see Chart 5.2.3 for treatment recommendations. If you didn't have adjuvant treatment because tests after surgery found metastases, see Part 5.5 for treatment recommendations.

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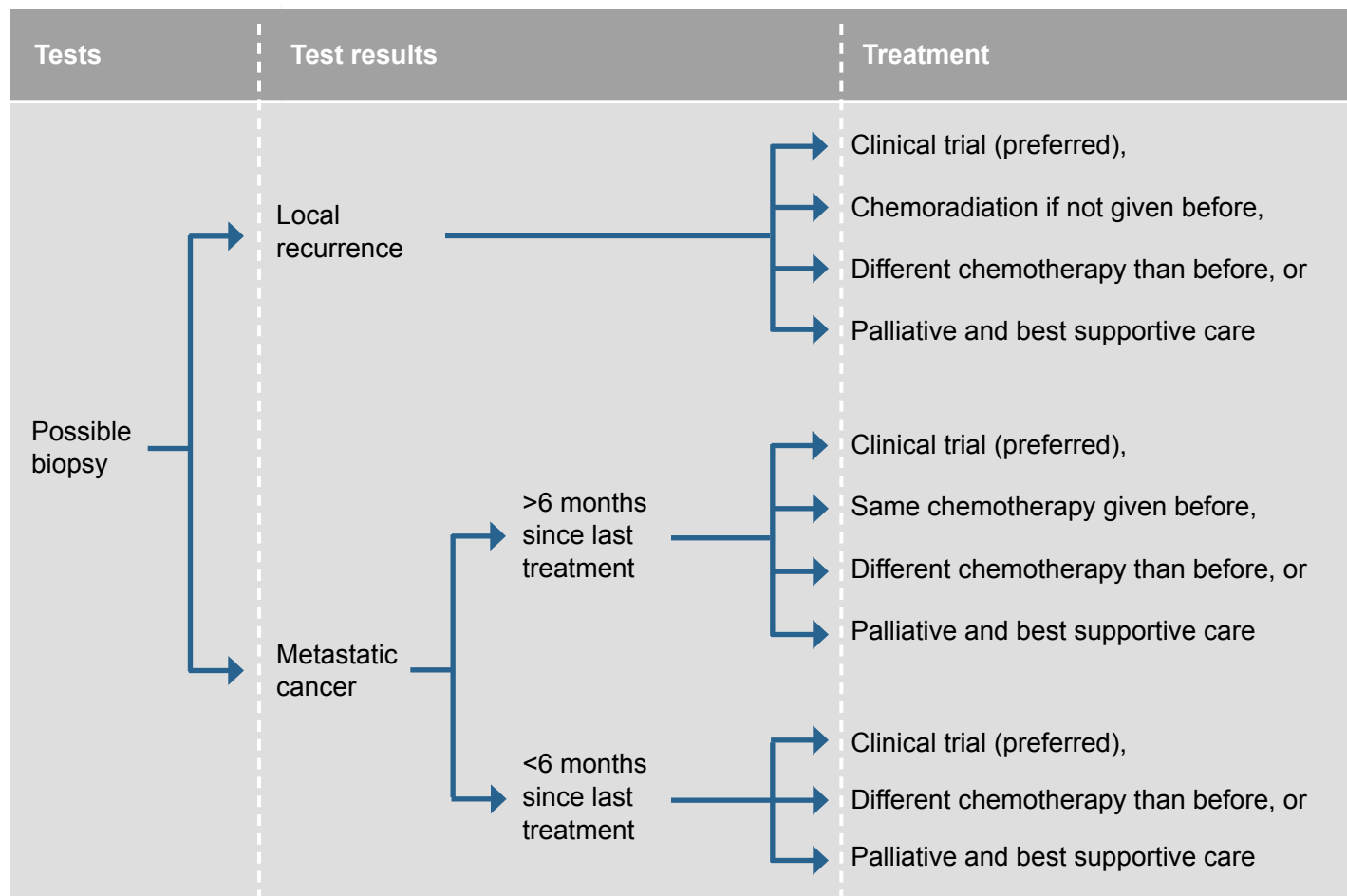
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**Chart 5.2.3 Treatment for recurrence after surgery**

**Chart 5.2.3** shows the tests and treatments that are recommended when there is a return (recurrence) of pancreatic cancer after surgery and adjuvant treatment.

### Tests and results

First, you may have a biopsy to confirm pancreatic cancer if not done previously. A biopsy is the removal of a sample of tissue from your body to test for cancer cells. Once pancreatic cancer is confirmed, you can receive treatment. Based on tests, your doctors will know how far the cancer has spread. Cancer that came back in or near the pancreas is called a local

recurrence. Cancer that has spread to sites far away from the pancreas is called metastatic cancer.

### Treatment

For pancreatic cancer recurrence, joining a clinical trial is always the preferred treatment choice above any other option. A clinical trial is a type of research that studies the safety and effectiveness of a test or treatment. (See page 30 for more details on clinical trials.) Best supportive care without active cancer treatment should also be considered, especially for patients with a poor health status. Your health status, also called performance status, is a rating



by your doctor based on your overall health, cancer symptoms, and ability to do daily activities. Supportive care—also called palliative care—is treatment to relieve the symptoms of cancer and side effects of cancer treatment. Read Part 4 on page 36 for details on supportive care. The other recommended treatments for a recurrence depend on how far the cancer has spread.

**For a local recurrence**, there are two other treatment options. One option is to receive chemoradiation if you haven't had it before. The other option is to receive a different chemotherapy than you had before. Read Part 3 on page 24 for details on each treatment.

**For metastatic cancer**, the other options depend on how long it has been since the last treatment was completed. If the cancer recurrence is more than 6 months after completing the last treatment, then options include the same chemotherapy you had before or a different chemotherapy. If the recurrence is less than 6 months after completing the last treatment, then the other option is to receive a different chemotherapy than before. Read Part 3 on page 28 for chemotherapy details.

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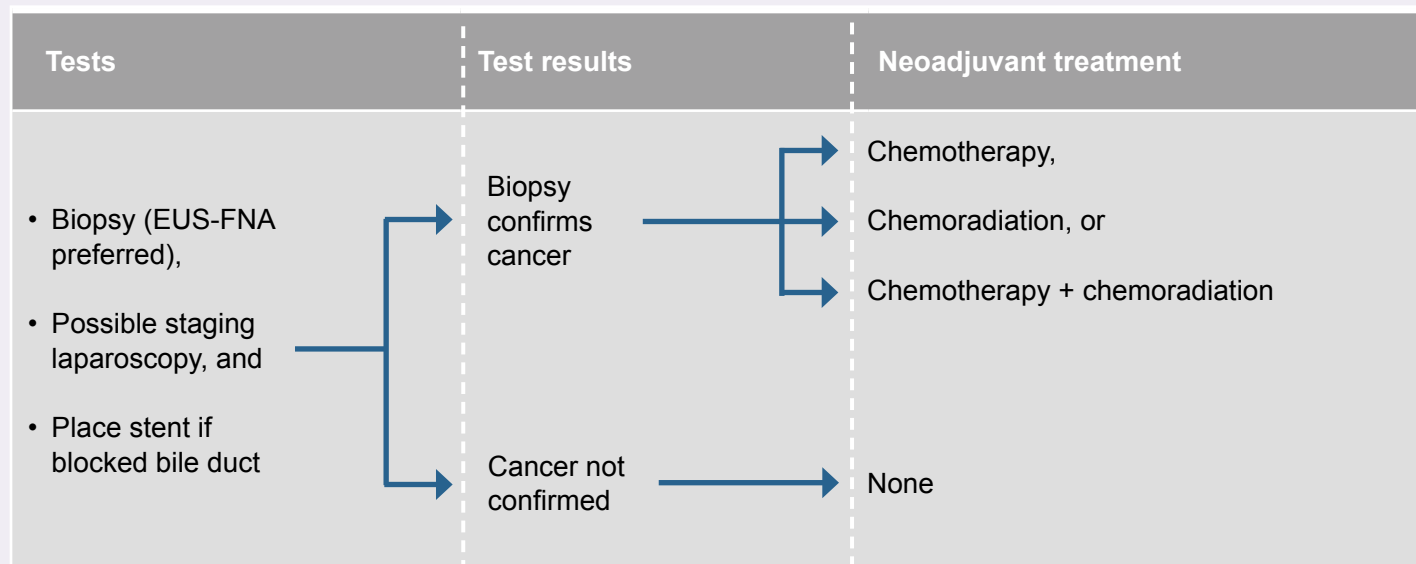
## 5.3 Borderline resectable pancreatic cancer

Part 5.3 describes the tests and treatments that are recommended for borderline resectable pancreatic cancer. This is when cancer is confined to the pancreas but approaches nearby structures or has severe symptoms, raising concern that the cancer might not be resectable with clear margins. A clear margin is when no cancer cells are found in the normal-looking tissue around the edge of the tumor removed during surgery. “Borderline resectable” means that it isn’t clear whether or not all of the cancer can likely be removed by surgery. Resectable means the cancer can be removed by surgery. Unresectable means it can’t be removed by surgery.

Primary treatment is the main treatment used to rid the body of cancer. Surgery should only be used as primary treatment if your doctors think all of the cancer can be completely removed. Thus, your doctor may plan to give you treatment before surgery to try to shrink the cancer to increase the chances that it can all be removed. This is called neoadjuvant treatment. However, your doctor may choose not to give neoadjuvant treatment and just plan to do surgery right away.

For planned neoadjuvant treatment, see Chart 5.3.1 below. For planned surgery without neoadjuvant treatment, see Chart 5.3.3.

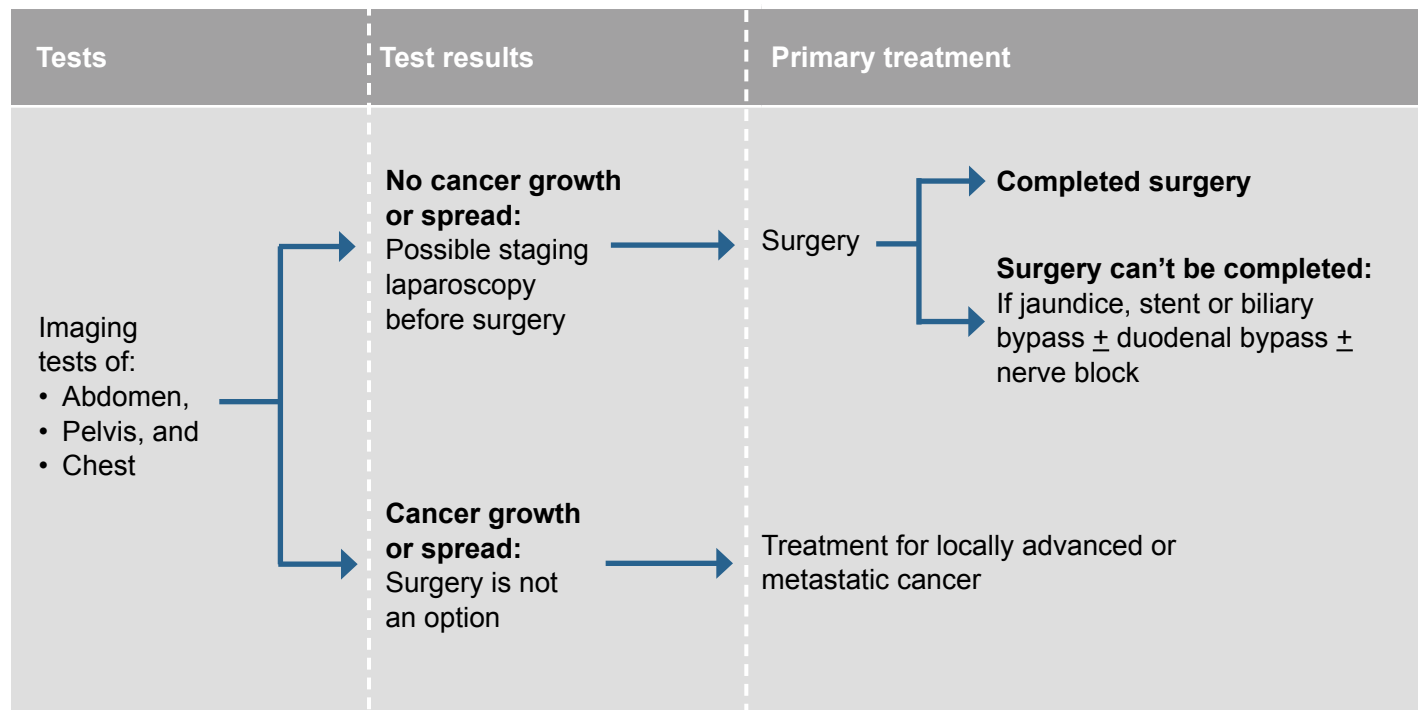
**Chart 5.3.1 Planned neoadjuvant treatment**



**Chart 5.3.1** shows the recommended options for neoadjuvant treatment for borderline resectable pancreatic cancer. The goal of neoadjuvant treatment

is to shrink the cancer so that it can all be removed with surgery.



**Chart 5.3.2 Follow-up after neoadjuvant treatment**

**Chart 5.3.2** shows the follow-up tests and treatments that are recommended after completing neoadjuvant treatment for borderline resectable pancreatic cancer. Follow-up tests are given after treatment to check how well treatment worked. These tests look for signs of cancer growth or spread.

## Tests

Imaging tests of your belly area (abdomen), pelvis, and chest are recommended. Imaging tests are tests that take pictures of the inside of your body. (Read Part 2 on page 15 for imaging test details.) The imaging tests of your abdomen should be done in a certain way, called a pancreatic protocol. A pancreatic protocol imaging test is done in a special way so that it focuses specifically on the pancreas. This allows doctors to clearly see the pancreas, nearby blood vessels, and tiny tumors.

## Test results and primary treatment

**If the follow-up tests don't show any signs of cancer growth or spread**, then you may have a staging laparoscopy before surgery to remove the cancer. A staging laparoscopy is a surgical test used to see how far the cancer has spread and confirm if it all can be removed by surgery. If your doctors still think all the cancer can be removed, then you will have primary treatment with surgery. There are 3 types of surgery for pancreatic cancer. Which type of surgery you will have depends on the size and location of the cancer in your pancreas. Read Part 3 on page 24 for details on the types of surgery used to remove pancreatic cancer.

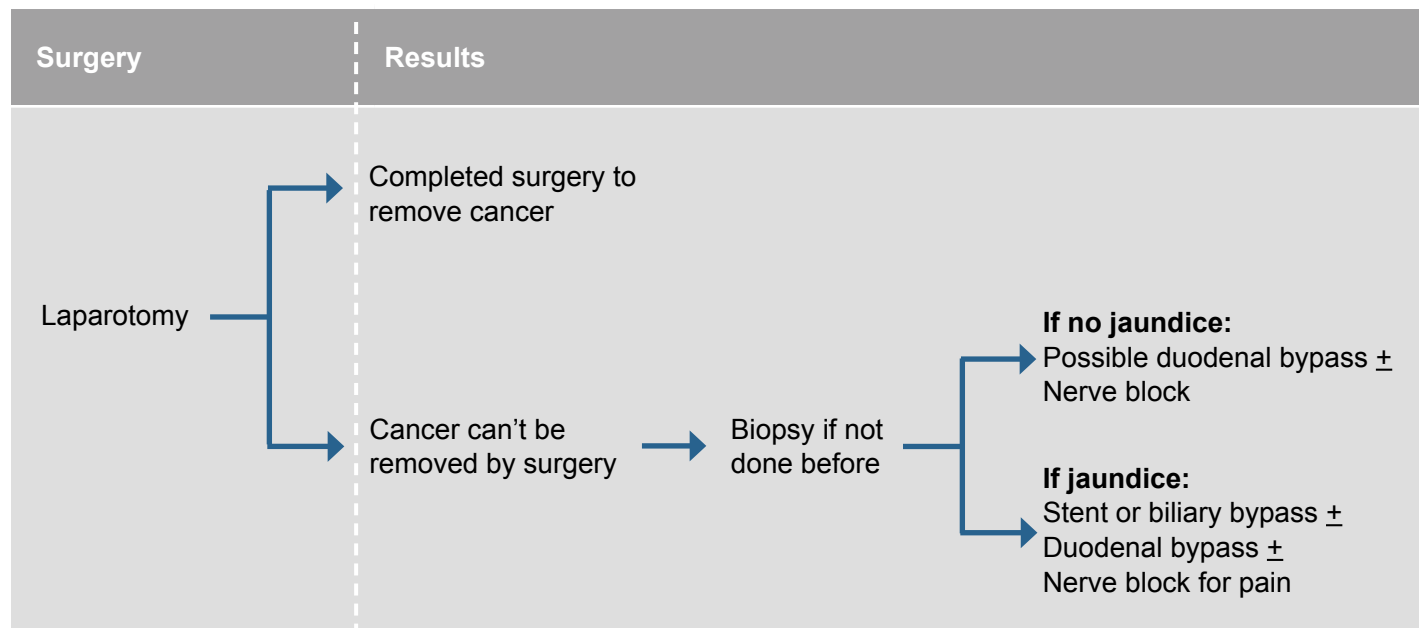
Surgery should be done 4 to 8 weeks after neoadjuvant treatment. Surgery can be done more than 8 weeks afterward, but radiation-induced fibrosis

At the time of surgery your doctor may find that the cancer has spread too far to all be removed. In this case, surgery cannot be completed. At this time, if you have jaundice, your doctor may give treatments for symptoms caused by the cancer. This is called supportive care. Your doctor will place a stent in the blocked bile duct or do a biliary bypass to relieve jaundice. You may have a duodenal bypass to relieve or prevent a blocked stomach. Your doctor may also do a nerve block to relieve severe pain. Read Part 4 on page 36 for details on each of these supportive care treatments.

**If the follow-up tests showed signs of cancer growth or spread,** then surgery is not recommended. In this case, the next treatment recommended depends on how far the cancer has spread. Cancer that has spread only to blood vessels or other tissues near the pancreas is called locally advanced unresectable. Cancer that has spread to sites far away from the pancreas is called metastatic.

If the cancer was removed by surgery, see Chart 5.3.4 for adjuvant treatment recommendations. If the cancer spread before surgery or if it couldn't be removed by surgery, see Part 5.4 for locally advanced unresectable cancer or Part 5.5 for metastatic cancer treatment recommendations.

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**Chart 5.3.3 Planned surgery**

**Chart 5.3.3** shows the recommended tests and treatments for borderline resectable pancreatic cancer when your doctor plans to do surgery without neoadjuvant treatment. First, you will have a laparotomy—an up-and-down surgical cut through the abdomen. This lets your doctor see the tumor in your pancreas along with other organs and tissues nearby.

## Surgery

There is more than one type of surgery for pancreatic cancer. Which type of surgery is recommended depends on the size and location of the cancer in your pancreas. Read Part 3 on page 24 for details. NCCN experts recommend that surgery for pancreatic cancer should only be done at a hospital that does more than 15 pancreatic cancer surgeries each year. Hospitals that perform many pancreatic surgeries often have better results.

## Results

**At the beginning of surgery, your doctor may find that the cancer has spread too far to all be removed.** In this case, surgery can't be completed. At this time, you will have a biopsy to confirm pancreatic cancer if not done previously. A biopsy is the removal of tissue from your body to test for cancer cells. The next treatments depend on if you have symptoms of jaundice. Jaundice is a yellowing of the eyes and skin due to a buildup of bilirubin in the body. A pancreatic tumor can cause jaundice by blocking a bile duct so the bilirubin can't drain out of the liver.

If you don't have jaundice, then your doctor may do a duodenal bypass. This is a surgery to re-route the path eaten food takes out of your stomach to the duodenum, the first part of the small intestine. This surgery may be done if the tumor is blocking or is at risk of blocking food from passing out of your stomach. If you have severe pain, your doctor may inject alcohol into the nerves near the pancreas to destroy them to relieve the pain. This is called a nerve block.



If you do have jaundice, your doctor may place a stent to unblock the bile duct so the bile—and bilirubin—can drain out. Or, you may have a biliary bypass. This is a surgery to re-route bile flow around the blocked part of the bile duct. Other treatments may include a duodenal bypass and nerve block as described in the previous paragraph.

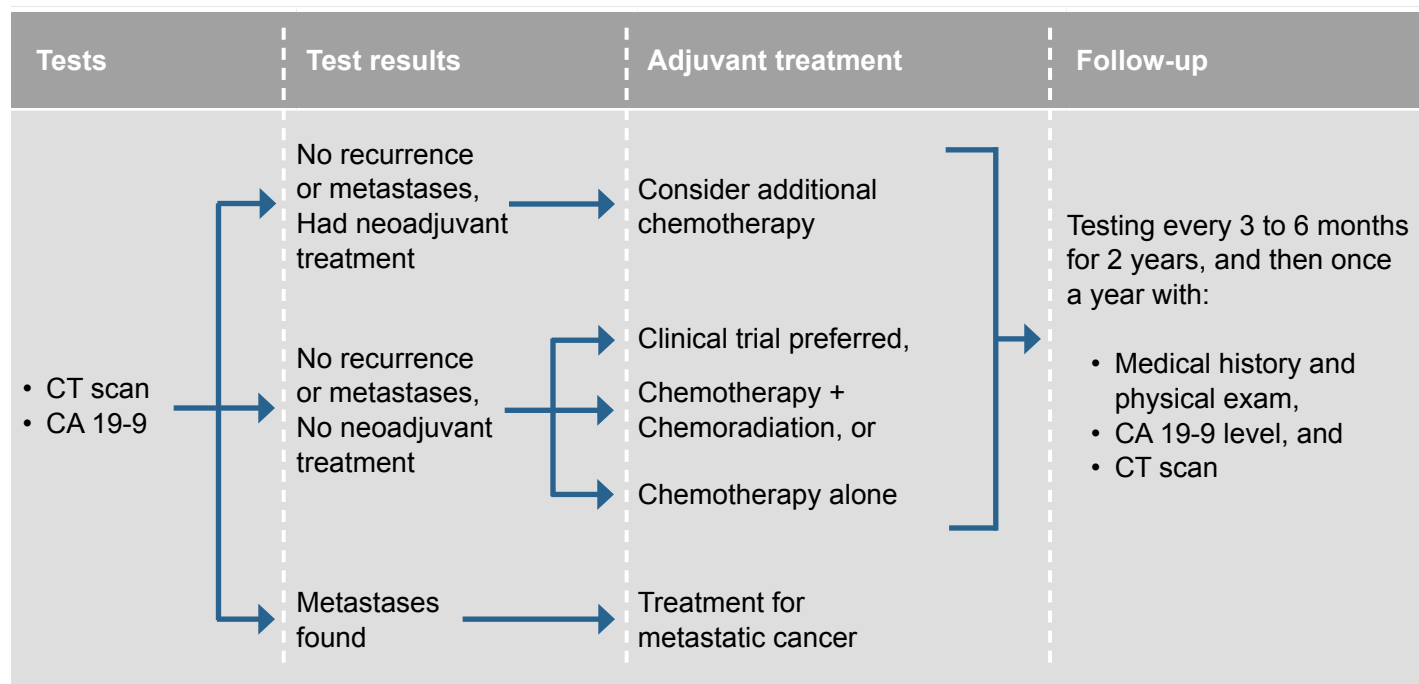
The next treatment options depend on how far the cancer has spread. Cancer that has spread outside the pancreas to nearby blood vessels or other tissues and can't be removed by surgery is called locally advanced unresectable pancreatic cancer. Cancer that has spread outside the pancreas to far sites in the body is called metastatic pancreatic cancer.

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#### Next steps: ➞

If the cancer was removed by surgery, see Chart 5.3.4 for adjuvant treatment recommendations. If the cancer couldn't be removed by surgery, see Part 5.4 for locally advanced unresectable cancer treatment recommendations, or see Part 5.5 for metastatic cancer treatment recommendations.

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**Chart 5.3.4 Adjuvant treatment after surgery**

Options for chemotherapy given before or after chemoradiation:

- Gemcitabine,
- 5-FU/leucovorin, or
- Continuous infusion 5-FU

Options for chemotherapy alone:

- Gemcitabine,
- 5-FU/leucovorin,
- Continuous infusion 5-FU, or
- Capecitabine

**Chart 5.3.4** shows the tests and treatments that are recommended after completing primary treatment with surgery for borderline resectable pancreatic cancer. Primary treatment is the first or main treatment given to rid the body of cancer. Adjuvant treatment is given after primary treatment to try to kill any remaining cancer cells.

## Tests

Before beginning adjuvant treatment, you will have a CT scan and CA 19-9 blood test. These tests are

done to check for signs of recurrence—the return of cancer after treatment. They also check for metastases—cancer that has spread outside the pancreas to far sites in the body. Read Part 2 on page 14 for test details.

## Test results

**If tests show metastases**, then adjuvant treatment is not recommended. Instead, you will receive treatment for metastatic pancreatic cancer. See *Next steps* at the end of this section.

**If the tests don't show any signs of recurrence or metastases**, the next treatment recommendations depend on whether or not you had neoadjuvant treatment before surgery. **If you had neoadjuvant treatment**, then your doctor may want to give you more chemotherapy as adjuvant treatment. However, doctors don't often give both neoadjuvant and adjuvant treatment for pancreatic cancer.

**If you did not have neoadjuvant treatment before surgery**, then you have 3 options to choose from for adjuvant treatment. Adjuvant treatment should only be started after you've fully recovered from surgery. Starting 4 to 8 weeks after surgery is ideal.

## Adjuvant treatment

There are three main adjuvant treatment options to choose from. Taking part in a clinical trial is strongly recommended and is the preferred option for adjuvant treatment. A clinical trial is a type of research that studies the safety and effectiveness of a test or treatment. Read Part 3 on page 30 for more details on clinical trials.

If you aren't able to join a clinical trial, another option is to receive chemotherapy and chemoradiation. In this case, chemotherapy may be given before or after chemoradiation. Another CT scan is recommended after chemotherapy if it will be followed by chemoradiation. Recommended chemotherapy drugs include gemcitabine, 5-FU with leucovorin, or continuous infusion 5-FU. Chemoradiation may be fluoropyrimidine-based or gemcitabine-based. Read Part 3 on page 24 for details on each treatment.

The third option is to receive chemotherapy only. In this case, chemotherapy drug options include gemcitabine, 5-FU with leucovorin, continuous infusion 5-FU, or capecitabine. Gemcitabine is

preferred because its side effects aren't as severe as 5-FU/leucovorin. Capecitabine is suggested as a last choice only when other options cannot be used.

## Follow-up

After completing adjuvant treatment, you will have follow-up tests. Follow-up tests are tests given after treatment to check how well treatment worked. These tests look for signs of cancer return (recurrence) or spread (metastasis) after treatment.

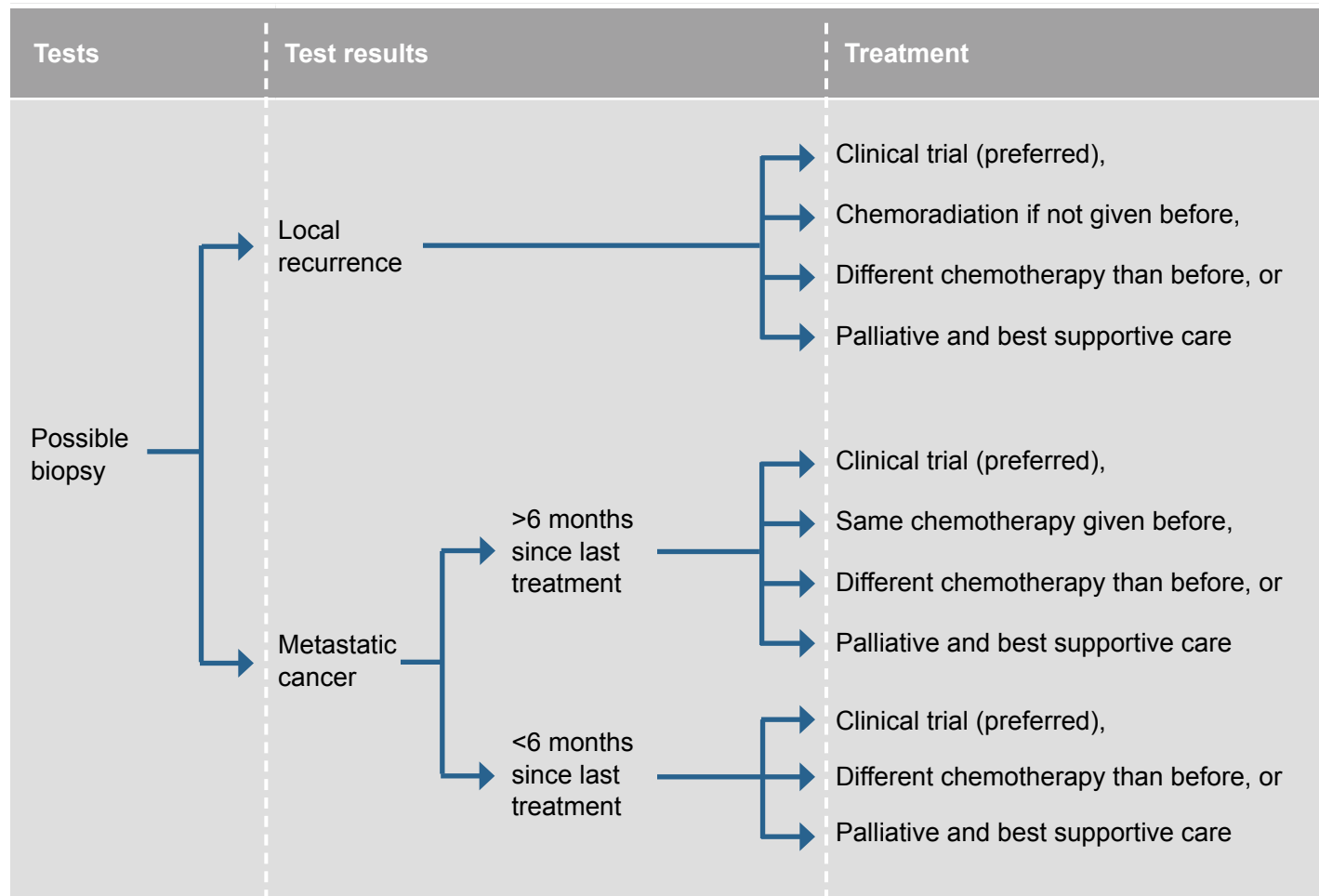
Follow-up tests are recommended every 3 to 6 months for 2 years, and then once every year. A medical history and physical exam can help to find signs and symptoms of pancreatic cancer early. CA 19-9 is a substance found in blood and high levels can be caused by pancreatic cancer. Thus, a CA 19-9 blood test is recommended as part of follow-up testing. A CT scan is also recommended to look for early signs of cancer recurrence. Read Part 2 on page 14 for test details.

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## Next steps: ➡

After completing adjuvant treatment, if follow-up tests show a recurrence, see Chart 5.3.5 for treatment recommendations. If tests after surgery found metastases, see Part 5.5 for treatment recommendations.

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**Chart 5.3.5 Treatment for recurrence after surgery**

**Chart 5.3.5** shows the tests and treatments that are recommended when there is a return (recurrence) of cancer after surgery and adjuvant treatment.

### Tests and results

First, you may have a biopsy to confirm pancreatic cancer if not done previously. A biopsy is the removal of a sample of tissue from your body to test for cancer cells. Once pancreatic cancer is confirmed, you can receive treatment. Based on these tests, your doctors will know how far the cancer has spread. Cancer that came back in or near the pancreas is called a local

recurrence. Cancer that has spread to sites far away from the pancreas is called metastatic cancer.

### Treatment

For pancreatic cancer recurrence, joining a clinical trial is always the preferred treatment choice above any other option. A clinical trial is a type of research that studies the safety and effectiveness of a test or treatment. (See page 30 for more details on clinical trials.) Best supportive care without active cancer treatment should also be considered, especially for patients with a poor health status. Your health

**For a local recurrence**, there are two other treatment options. One option is to receive chemoradiation if you haven't had it before. The other option is to receive a different chemotherapy than you had before. Read Part 3 on page 24 for details on each treatment.

**For metastatic cancer,** the other options depend on how long it has been since the last treatment was completed. If the cancer recurrence is more than 6 months after completing the last treatment, then options include the same chemotherapy you had before or a different chemotherapy. If the recurrence is less than 6 months after completing the last treatment, then the other option is to receive a different chemotherapy than before. Read Part 3 on page 28 for chemotherapy details.

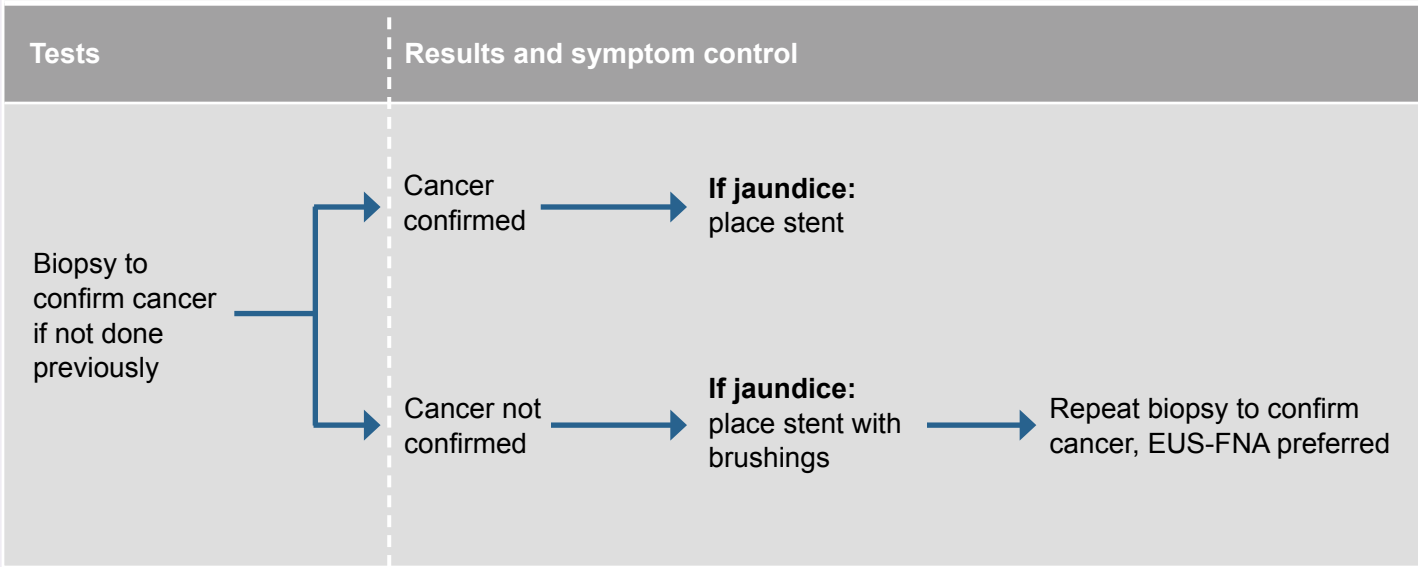
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5.4 Locally advanced unresectable pancreatic cancer

Part 5.4 describes the tests and treatments that are recommended for cancer that has spread outside the pancreas to nearby blood vessels or other tissues and can't be removed by surgery. This is called locally advanced unresectable.

Cancer that can be removed by surgery is called resectable. Cancer that can't be removed by surgery is called unresectable.

Chart 5.4.1 Pretreatment tests and symptom control



**Chart 5.4.1** shows the recommended pretreatment steps for locally advanced unresectable pancreatic cancer. The pretreatment process may include some tests and managing symptoms caused by the cancer.

Tests

Before beginning cancer treatment, a biopsy is recommended to confirm pancreatic cancer if not done previously. A biopsy is the removal of a sample

of tissue from your body to test for cancer cells. (Read Part 2 on page 19 for details.)

Results and symptom control

**If a biopsy confirms pancreatic cancer**, then the next step is to treat symptoms caused by the cancer. One common symptom is jaundice—a yellowing of the skin and eyes due to a buildup of bilirubin in the blood. Bilirubin is a yellow-brown substance in

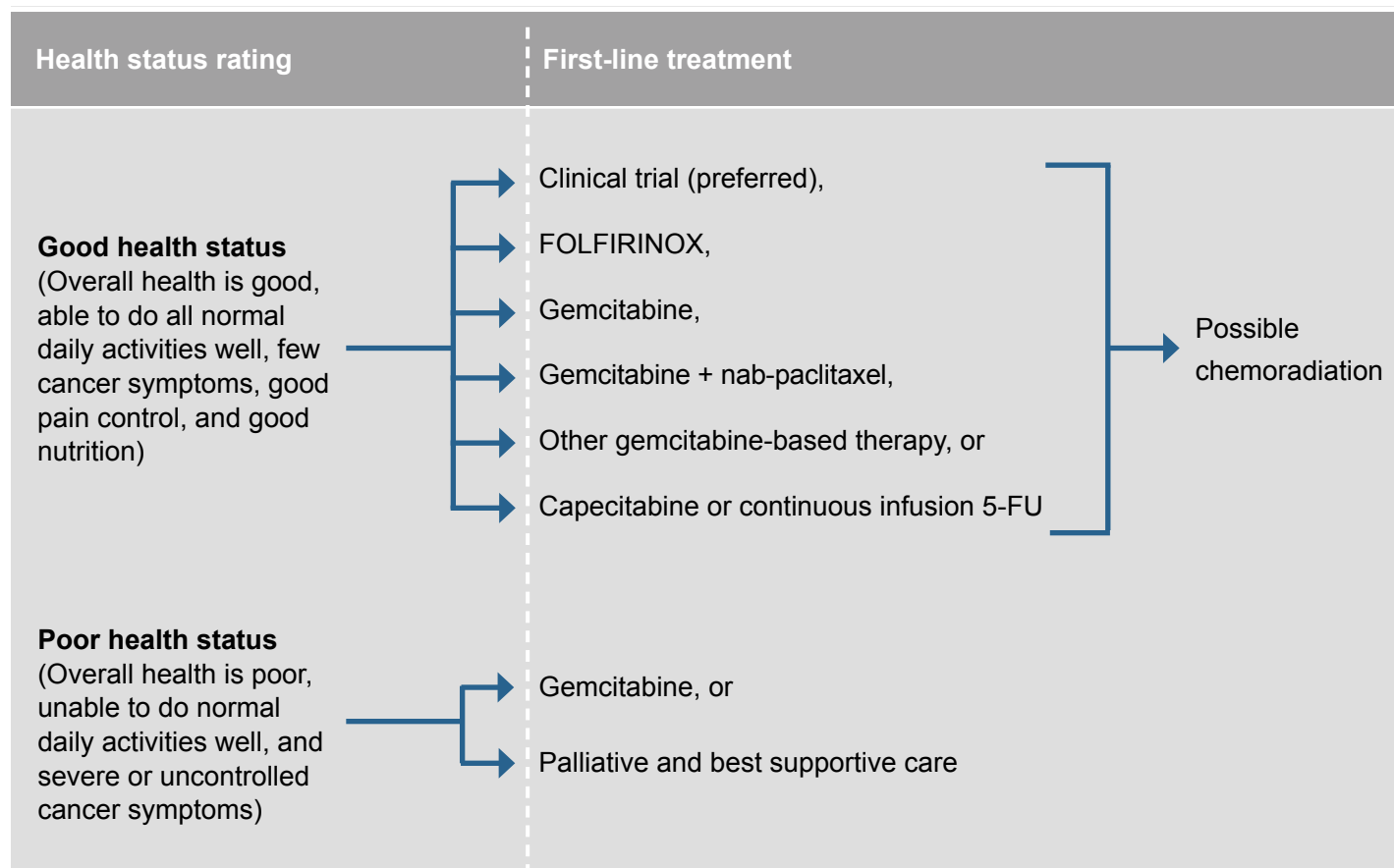


bile—a digestive fluid made in the liver. A tumor can cause jaundice by blocking a duct that drains bile and bilirubin from the liver. If you have jaundice, your doctor may place a stent to unblock the bile duct. But, a stent is not needed if you had a biliary bypass during a previous surgery or laparoscopy. (Read Part 4 on page 36 for details on supportive care for treating jaundice and other cancer symptoms.)

**If the first biopsy doesn't confirm pancreatic cancer**, then the next step is to treat symptoms such as jaundice as described in the previous paragraph. However, when placing the biliary stent, your doctor may also take samples—called brushings—of the duct for testing. Then, at least two more biopsies should be done to try to confirm pancreatic cancer. There is more than one type of biopsy that can be used, but EUS-FNA is preferred. Read Part 2 on page 19 for biopsy details.

Next steps: ➞

After confirming pancreatic cancer with a biopsy and treating jaundice, see Chart 5.4.2 for treatment recommendation.

**Chart 5.4.2 First-line treatment with drugs**

**Chart 5.4.2** shows the first-line treatment recommendations for locally advanced unresectable pancreatic cancer. First-line treatment is the first treatment or set of treatments given to control the cancer. First-line treatment options include a clinical trial, chemotherapy, chemoradiation, and supportive care.

## Health status rating

Which treatment is recommended for you depends on your health status rating, also called performance status. Your health status is a rating by your doctor based on your overall health, cancer symptoms, and ability to do daily activities. Good health status means that your overall health is good. You're able to

continue doing all of your regular daily activities very well. You also have very few or very mild symptoms of the cancer and you're able to eat well. Poor health status means that your overall health is poor. You aren't able to do your regular daily activities well. The number and/or severity of cancer symptoms is increased.

Your health status rating is a very important factor when choosing the best treatment for you. This is because healthier patients are able to tolerate treatments with higher risks of side effects. Certain treatments and drug combinations have a higher risk of severe, even lethal, side effects. Your doctor should explain all of the risks and possible side effects of the treatments you receive.

## First-line treatment

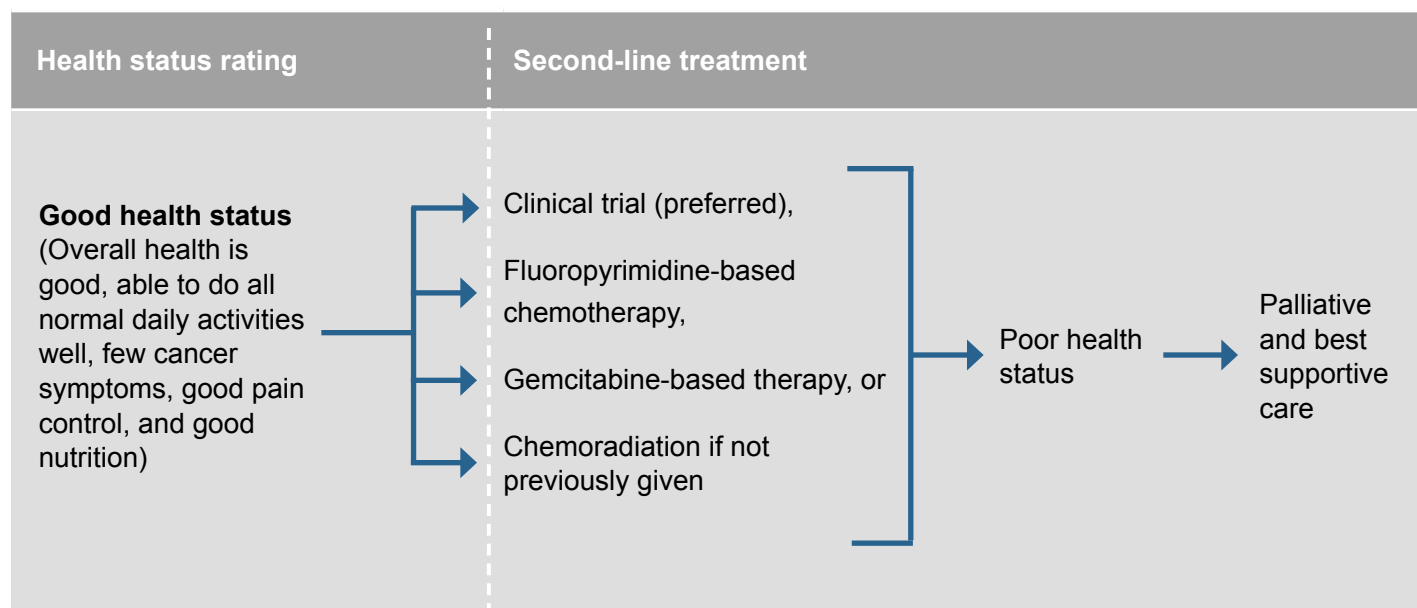
**If you have a good health status**, then there are several first-line treatment options to choose from. The preferred option is to receive treatment within a clinical trial. A clinical trial is a type of research that studies the safety and effectiveness of a test or treatment. (Read page 30 for details on clinical trials.) Your other options are chemotherapy drugs that have been tested in clinical trials.

The other options include FOLFIRINOX, gemcitabine alone, gemcitabine with nab-paclitaxel, a different gemcitabine-based combination regimen, capecitabine, or continuous infusion 5-FU. FOLFIRINOX is a combination regimen that includes 5-FU, leucovorin, irinotecan, and oxaliplatin. (Read Part 3 on page 28 for treatment details.) Following any of these chemotherapy options, you may receive chemoradiation if there is no cancer growth for months and no signs of distant metastases.

**If you have a poor health status**, there are two treatment options to choose from. One option is to receive gemcitabine alone. The other option is to receive the best palliative and supportive care available. Supportive care—also called palliative care—is treatment for the symptoms and health conditions caused by pancreatic cancer. Read Part 4 on page 36 for details.

Next steps: 

If first-line treatment doesn't stop cancer growth, see Chart 5.4.3 for second-line treatment recommendations. If the cancer spreads far from the first tumor, see Part 5.5 for metastatic cancer treatment recommendations.

**Chart 5.4.3 Second-line treatment**

**Chart 5.4.3** shows the second-line treatment options that are recommended for locally advanced unresectable pancreatic cancer. Second-line treatment is the next set of treatments given when the first or previous treatments failed to stop cancer growth.

## Health status rating

Which treatment is recommended for you depends on your health status rating, also called performance status. Your health status is a rating by your doctor based on your overall health, cancer symptoms, and ability to do daily activities. Good health status means that your overall health is good. You're able to continue doing all of your regular daily activities very well. You also have very few or very mild symptoms of the cancer and you're able to eat well. Poor health status means that your overall health is poor. You aren't able to do your regular daily activities well. The number and/or severity of cancer symptoms is increased.

Your health status rating is a very important factor when choosing the best treatment for you. This is because healthier patients are able to tolerate treatments with higher risks of side effects. Certain treatments and drug combinations have a higher risk of severe, even lethal, side effects. Your doctor should explain all of the risks and possible side effects of the treatments you receive.

If you have a poor health status after first-line treatment, then supportive care is recommended. If you have a good health status after first-line treatment, then you may receive second-line treatment.

## Second-line treatment

**If you have a good health status after first-line treatment**, there are four main options for second-line treatment. The preferred option is to receive treatment within a clinical trial. A clinical trial is a type of research that studies the safety and effectiveness

**If you have a poor health status after second-line treatment**, then the next option is palliative and best supportive care. Supportive care—also called palliative care—is treatment for the symptoms and health conditions caused by pancreatic cancer. Read Part 4 on page 36 for details.



If the cancer spreads far from the first tumor, see Part 5.5 for metastatic cancer treatment recommendations.

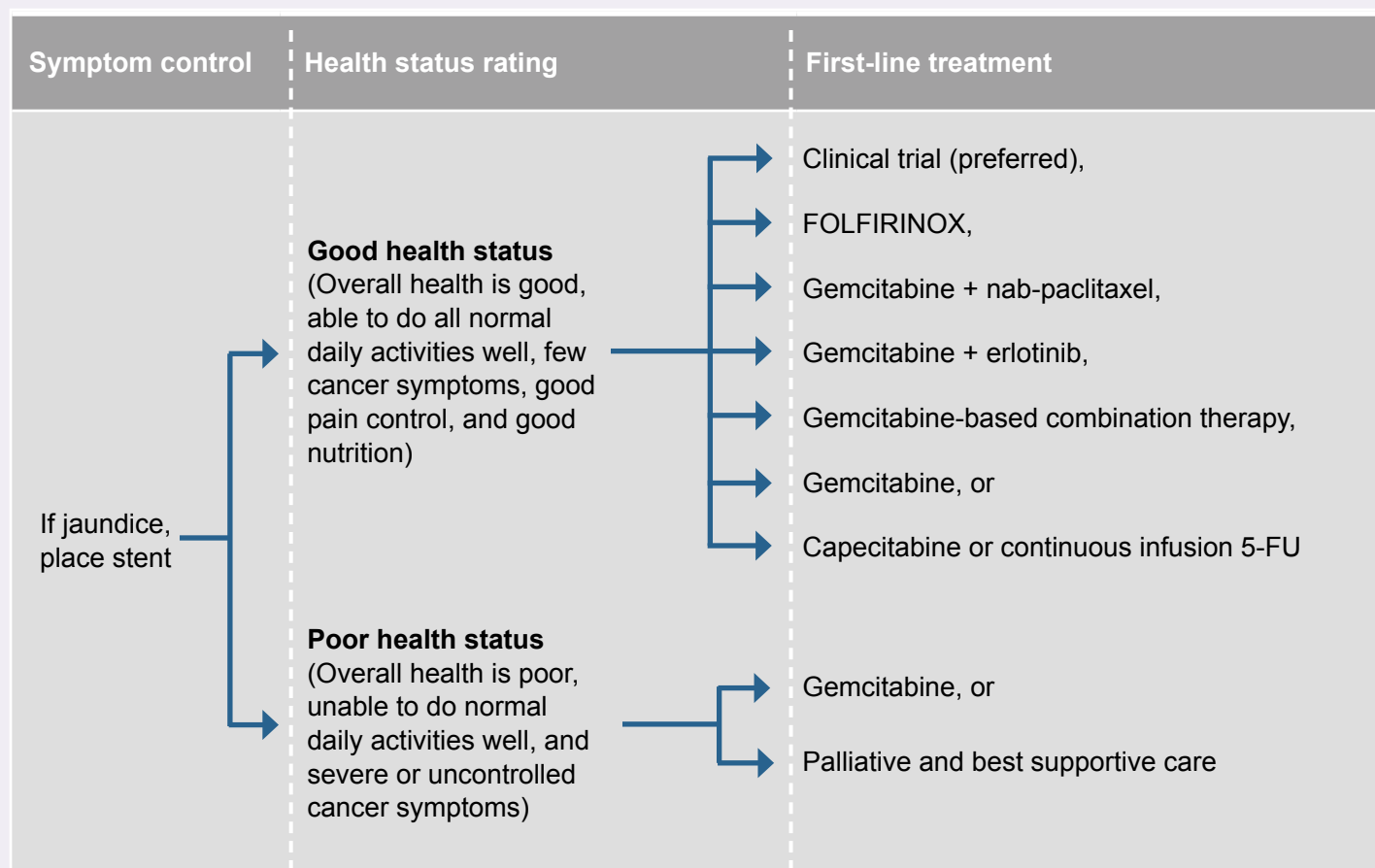
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## 5.5 Metastatic pancreatic cancer

Part 5.5 describes the tests and treatments that are recommended for cancer that has spread outside the pancreas to far sites in the body. This is called metastatic pancreatic cancer.

Metastasis is the spread of cancer from the first tumor to another part of the body. Metastatic tumors are formed by cancer cells that have spread far away from the first tumor in the pancreas.

**Chart 5.5.1 First-line treatment**



**Chart 5.5.1** shows the first-line treatment options for metastatic pancreatic cancer. First-line treatment is the first treatment or set of treatments given to control the cancer. First-line treatment options include a clinical trial, chemotherapy, targeted therapy, and supportive care.

### Symptom control

Before beginning treatment for the cancer, your doctor will first give treatment for symptoms such as jaundice. Jaundice is a yellowing of the skin and eyes caused by a buildup of bilirubin in the body. A tumor



in the pancreas can cause jaundice by blocking the bile duct that drains bilirubin out of the liver. To relieve symptoms of jaundice, your doctor will place a stent in the bile duct to unblock it (see page 36 for details). But, a stent is not needed if you had a biliary bypass during a previous surgery or laparoscopy.

## Health status rating

Which first-line treatment option is recommended for you depends on your health status rating, also called performance status. Your health status is a rating by your doctor based on your overall health, cancer symptoms, and ability to do daily activities. Good health status means that your overall health is good. You're able to continue doing all of your regular daily activities very well. You also have very few or very mild symptoms of the cancer and you're able to eat well. Poor health status means that your overall health is poor. You aren't able to do your regular daily activities well. The number and/or severity of cancer symptoms is increased.

Your health status rating is a very important factor when choosing the best treatment for you. This is because healthier patients are able to tolerate treatments with higher risks of side effects. Certain treatments and drug combinations have a higher risk of severe, even lethal, side effects. Your doctor should explain all of the risks and possible side effects of the treatments you receive.

## First-line treatment

**If you have a good health status**, then there are several first-line treatment options to choose from. The preferred option is to receive treatment within a clinical trial. A clinical trial is a type of research that studies the safety and effectiveness of a test or treatment. (Read page 30 for details on clinical trials.) Your other options are chemotherapy drugs that have been tested in clinical trials.

The other options include FOLFIRINOX, gemcitabine with nab-paclitaxel, gemcitabine with erlotinib, a different gemcitabine-based combination regimen, gemcitabine alone, capecitabine, or continuous infusion 5-FU. FOLFIRINOX is a combination regimen that includes 5-FU, leucovorin, irinotecan, and oxaliplatin. (Read Part 3 on page 28 for treatment details.)

**If you have a poor health status**, there are two treatment options to choose from. One option is to receive gemcitabine alone. The other option is to receive the best palliative and supportive care available. Supportive care—also called palliative care—is treatment for the symptoms and health conditions caused by pancreatic cancer. Read Part 4 on page 36 for more details on supportive care.

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Next steps: 

If first-line treatment doesn't stop the cancer from growing, see Chart 5.5.2 for second-line treatment recommendations.

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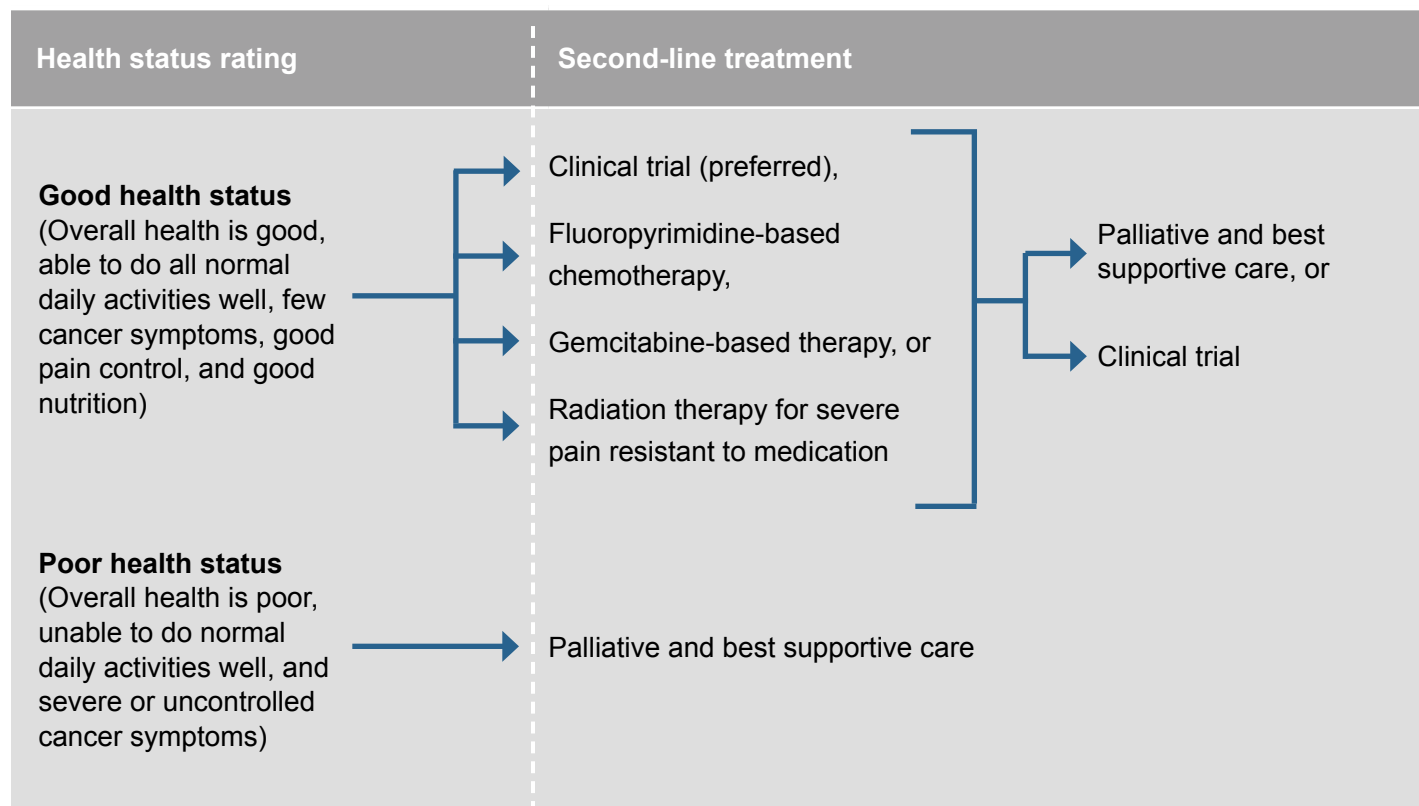
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**Chart 5.5.2 Second-line treatment**

**Chart 5.5.2** shows the second-line treatment options that are recommended for metastatic pancreatic cancer. Second-line treatment is the next set of treatments given when the first or previous treatments failed to stop cancer growth.

## Health status rating

Which treatment is recommended for you depends on your health status rating, also called performance status. Your health status is a rating by your doctor based on your overall health, cancer symptoms, and ability to do daily activities. Your doctor will rate your health status again after first-line treatment to decide which option is best to give you next.

Good health status means that your overall health is good. You're able to continue doing all of your regular daily activities very well. You also have very few or very mild symptoms of the cancer and you're able to eat well. Poor health status means that your overall health is poor. You aren't able to do your regular daily activities well. The number and/or severity of cancer symptoms is increased.

Your health status rating is a very important factor when choosing the best treatment for you. This is because healthier patients are able to tolerate treatments with higher risks of side effects. Certain treatments and drug combinations have a higher risk of severe, even lethal, side effects. Your doctor should explain all of the risks and possible side effects of the treatments you receive.

## Second-line treatment

**If you have a good health status after first-line treatment,** there are four main options for second-line treatment. The preferred option is to receive treatment within a clinical trial. A clinical trial is a type of research that studies the safety and effectiveness of a test or treatment. (Read Part 3 on page 30 for details on clinical trials.) The next two options depend on the type of chemotherapy you had before. Fluoropyrimidine-based chemotherapy is an option if you had a gemcitabine-based regimen before. Likewise, gemcitabine-based therapy is an option if you had a fluoropyrimidine-based regimen before. Lastly, radiation therapy may be given if you have severe pain that wasn't helped by pain medications.

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If second-line treatment doesn't stop the cancer from growing or spreading, then you have two more treatment options. One option is to receive the best palliative and supportive care available. Supportive care—also called palliative care—is treatment for the symptoms and health conditions caused by pancreatic cancer. The other option is to join a clinical trial.

**If you have a poor health status after first-line treatment,** then palliative and best supportive care is recommended. Read Part 4 on page 36 for more details about supportive care.

## My notes

[illegible]



# Making treatment decisions



# 6 Making treatment decisions

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Cancer can be stressful. While absorbing the fact that you have cancer, you must also learn about tests and treatments. And, the time you have to decide on a treatment plan may feel short. Parts 1 through 5 aimed to teach you about pancreatic cancer, its treatment, and other challenges. Part 6 aims to help you talk with your doctor and make treatment decisions that are right for you.

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## Have a treatment plan

Learning you have cancer starts an unplanned journey to an unknown place. A treatment plan is like having a roadmap for your journey. It is a written course of action through treatment and beyond. It can help you, your loved ones, and your treatment team.

### Parts of a treatment plan

A treatment plan addresses all cancer care needs while respecting your beliefs, wishes, and values. It is likely to change and expand as you go through treatment. The plan will include the role of your doctors and how you can help yourself. A treatment plan often has the following parts:

#### Cancer information

Cancer can greatly differ even when people have cancer in the same organ. Test results that describe the cancer are reported in the treatment plan. Such test results include the cancer site, cell type, and cancer stage. See Part 2 to read more about the tests used for pancreatic cancer.



### Your treatment team

Treating pancreatic cancer takes a team approach. NCCN recommends that treatment decisions involve a multidisciplinary team—doctors and other professionals who are experts in different areas of health care. A medical oncologist is a doctor who's an expert in treating cancer with drugs. A surgeon is an expert in operations to remove or repair a part of the body. A radiation oncologist is an expert at treating cancer with radiation. A pathologist is an expert in testing cells and tissue to find disease. A gastroenterologist is an expert in diseases of the digestive system—organs that break down food for the body to use.

Your primary care doctor can also be part of your team. He or she can help you express your feelings about treatments to the team. Treatment of other medical problems may be improved if he or she is informed of your cancer care. Besides doctors, you may receive care from nurses, social workers, and other health experts. Ask to have the names and contact information of your health care providers included in the treatment plan.

### Cancer treatment

There is no single treatment practice that is best for all patients. There is often more than one treatment option, including clinical trials. Clinical trials study how well a treatment works and its safety. Treatment planning for pancreatic cancer takes into account many factors, such as:

- Location of the cancer,
- Your general health,
- Treatment side effects,
- Costs of treatment,
- Changes to your life,
- What you want from treatment, and
- Your feelings about side effects.

A guide to pancreatic cancer treatment options can be found in Part 5. The cancer treatment that you and your doctors agree on should be reported in the treatment plan. It is also important to note the goal of treatment and the chance of a good treatment outcome. In addition, all known side effects should be listed and the time required to treat them should be noted. See Part 3 on page 27 for a list of some of the possible side effects of pancreatic cancer treatments.

Your treatment plan may change because of new information. You may change your mind about treatment. Tests may find new results. How well the treatment is working may change. Any of these changes may require a new treatment plan.

### Stress and symptom control

Cancer and its treatments can cause bothersome symptoms. The stress of having cancer can also cause symptoms. Such symptoms may include pain, sleep loss, and anxiety. Helping you to be comfortable and stay active are key goals of the treatment plan. There are ways to treat many symptoms, so tell your treatment team about any symptoms you have. Some of the challenges you may face are discussed next.

You may lose sleep before, during, and after treatment. Getting less sleep can affect your mood, conversations, and ability to do daily tasks. If possible, allow yourself to rest, let people do things for you, and talk with your doctor about sleep medication. Behavioral sleep medicine—a type of talk therapy—may also help.

Feelings of anxiety and depression are common among people with cancer. You may feel anxious before testing and while waiting for the results. Likewise, you may have a passing depression during a hard part of treatment. Feeling distressed may be a minor problem or it may be more serious. Serious or not, tell your treatment team so that you can get help if needed. At your cancer center, cancer navigators,



social workers, and other experts can help. Help can include support groups, talk therapy, or medication. Some people also feel better by exercising, talking with loved ones, or relaxing.

Financial stress is common. You may be unemployed or miss work during treatment. Or, you may have too little or no health insurance. Talk to your treatment team about work, insurance, or money problems. They will include information in the treatment plan to help you manage your finances and medical costs.

### Survivorship care

Cancer survivorship begins on the day you learn of having pancreatic cancer. For many survivors, the end of active treatment signals a time of celebration but also of great anxiety. This is a very normal response. You may need support to address issues that arise from not having regular visits with your cancer care team. In addition, your treatment plan should include a schedule of follow-up cancer tests, treatment of long-term side effects, and care of your general health.

### Advance care planning

Talking with your doctor about your prognosis can help with treatment planning. If the cancer can't be controlled or cured, a care plan for the end of life can be made. However, such talks often happen too late or not at all. Your doctor may delay these talks for fear that you may lose hope, become depressed, or have a shorter survival. Studies suggest that these fears are wrong. Instead, there are many benefits to advance care planning. It is useful for:

- Knowing what to expect,
- Making the most of your time,
- Lowering the stress of caregivers,
- Having your wishes followed,
- Having a better quality of life, and
- Getting good care.

Advance care planning starts with an honest talk between you and your doctors. You don't have to know the exact details of your prognosis. Just having a general idea will help with planning. With this information, you can decide at what point you'd want to stop chemotherapy or other treatments, if at all. You can also decide what treatments you'd want for symptom relief, such as radiation, surgery, or medicine.

Another part of the planning involves hospice care. Hospice care doesn't include treatment to fight the cancer but rather to reduce symptoms caused by cancer. Hospice care may be started because you aren't interested in more cancer treatment, no other cancer treatment is available, or because you may be too sick for cancer treatment. Hospice care allows you to have the best possible quality of life. Care is given all day, every day of the week. You can choose to have hospice care at home or at a hospice center. One study found that patients and caregivers had a better quality of life when hospice care was started early.

An advance directive describes the treatment you'd want if you weren't able to make your wishes known. It also can name a person whom you'd want to make decisions for you. It is a legal paper that your doctors have to follow. It can reveal your wishes about life-sustaining machines, such as feeding tubes. It can also include your treatment wishes if your heart or lungs were to stop working. If you already have an advance directive, it may need to be updated to be legally valid.

## Your role in planning

The role patients want in treatment planning differs. Some patients want to be involved as little as possible. Others want to know everything and share decision-making with their doctors. These two roles are described as passive and active. Tell your treatment team which role you want or if you want a role somewhere in the middle.

### Passive role

In a passive role, a person often doesn't seek out information, speak up for himself or herself, or think through treatment options. This may be due to a high level of stress. It may be hard to hear or know what others are saying. Stress, pain, and drugs can limit your ability to make good decisions. You may also want a passive role because you don't know much about cancer. You may have never heard the words used to describe pancreatic cancer, tests, or treatments. Likewise, you may think that your judgment isn't any better than your doctors'.

Letting others decide your treatment may make you feel more at ease. But, whom do you want to make the decisions? You may rely on your doctors alone to make the right decisions. You also can have loved ones help. They can gather information, speak on your behalf, and share in decision-making with your doctors. Even if others decide which treatment you will receive, you still have to agree by signing a consent form.

### Active role

In an active role, a person often searches for all information, prepares for all outcomes, and speaks up for himself or herself. He or she may take the lead or share in decision-making. Taking this role may make you feel more certain and hopeful. You'll likely get the treatment you want, at the place you want, and by the doctors you want.

There are four key steps to shared decision-making. First, know what you want from treatment. Do you want cancer control or symptom relief? What hardships are you willing to accept to meet your goal? Second, know your test results. This information can pinpoint what's important for you on websites and in books and brochures. It can also clarify which treatments are needed. Third, strive to have helpful talks with your doctor. Prepare questions before your visit and ask questions if your doctor isn't clear. You can also record your talks and get copies of your medical records. Fourth, accept help from others. An active role doesn't mean going through it alone. Others can help you be active by finding information, taking notes, asking questions, and helping you talk through your options.

## Getting a 2<sup>nd</sup> opinion

The time around a cancer diagnosis can be very stressful. People with cancer often want to start treatment as soon as possible. They want treatment before it spreads any further. While cancer can't be ignored, there is time to think about and choose which treatment plan is best for you.

**NCCN experts recommend getting a 2<sup>nd</sup> opinion before starting any course of treatment for pancreatic cancer.** Getting a 2<sup>nd</sup> opinion is when you have another doctor review your test results and the treatment plan your doctor has recommended. Pancreatic cancer is a serious disease, and new information may have been published about which treatments are most effective and safe. You may completely trust your doctor, but a 2<sup>nd</sup> opinion on which treatment is right for you can help.

Copies of all of the test results need to be sent to the doctor giving the 2<sup>nd</sup> opinion. Some people feel uneasy asking for copies from their doctors. However,

a 2<sup>nd</sup> opinion is a normal part of cancer care. When doctors have cancer, most will talk with more than one doctor before choosing their treatment. What's more, some health plans require a 2<sup>nd</sup> opinion. If your health plan doesn't cover the cost of a 2<sup>nd</sup> opinion, you have the choice of paying for it yourself.

Choosing your cancer treatment is a very important decision. It can affect length and quality of life. There are few cancers that are so aggressive that you can't take a few weeks to get a 2<sup>nd</sup> opinion and select the best treatment for you.



## Websites

### American Cancer Society

[www.cancer.org/Treatment/FindingandPayingforTreatment/index](http://www.cancer.org/Treatment/FindingandPayingforTreatment/index)

### National Cancer Institute

[www.cancer.gov/cancertopics/factsheet/Therapy/doctor-facility](http://www.cancer.gov/cancertopics/factsheet/Therapy/doctor-facility)

[www.cancer.gov/cancertopics/coping](http://www.cancer.gov/cancertopics/coping)

### National Coalition of Cancer Survivorship

[www.canceradvocacy.org/toolbox/](http://www.canceradvocacy.org/toolbox/)

### Pancreatic Cancer Action Network

[www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/hospice/](http://www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/hospice/)

[www.pancan.org/section-facing-pancreatic-cancer/recently-diagnosed/get-organized/](http://www.pancan.org/section-facing-pancreatic-cancer/recently-diagnosed/get-organized/)

[www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/treatment/specialists/](http://www.pancan.org/section-facing-pancreatic-cancer/learn-about-pan-cancer/treatment/specialists/)

### NCCN

[www.nccn.org/patients/resources/life\\_with\\_cancer/default.aspx](http://www.nccn.org/patients/resources/life_with_cancer/default.aspx)

## Review

- A treatment plan can help you through treatment and beyond.
- You can choose how active a role to have in planning your treatment.
- Shared decision-making is a process in which you and your doctors plan treatment together.
- You may wish to get a 2<sup>nd</sup> opinion on your treatment plan.

# Glossary

## Dictionary Acronyms

# Dictionary

**abdomen**

The belly area between the chest and pelvis.

**adjuvant treatment**

Treatment given after the main treatment used to rid the body of cancer.

**bile**

Yellowish-brown fluid made by the liver to help digest food.

**bile duct**

A tiny tube or vessel in the body that drains digestive fluid (bile) from the liver.

**biliary bypass**

Surgery to re-route the flow of bile—digestive fluid—from the common bile duct into the small intestine.

**biliary stent**

A small plastic or metal tube-shaped device used to unblock a bile duct—tube-shaped vessel that drains digestive fluid (bile) from the liver.

**bilirubin**

A yellow-brown substance that is removed from blood by the liver and is part of bile—a digestive fluid made by the liver.

**biopsy**

Removal of a small amount of tissue from the body to be tested for disease.

**blood chemistry test**

A test that measures the amount of certain substances in the blood to check for signs of disease.

**blood vessel**

A tube that blood circulates through in the body.

**borderline resectable**

Cancer that is confined to the pancreas but approaches nearby structures or has severe symptoms, raising concern that it might not be possible to remove all the cancer with surgery.

**bypass**

Surgery to re-route the flow of fluid in the body.

**CA 19-9**

Proteins made by cancer cells and found in blood.

**cancer stage**

A rating or description of the growth and spread of cancer in the body.

**chemoradiation**

Treatment that combines chemotherapy and radiation therapy.

**chemotherapy**

Drugs that kill fast-growing cells throughout the body, including cancer cells and normal cells.

**cholangitis**

An infection of the bile ducts—tiny tubes that drain digestive fluids out of the liver.

**clear margin**

No cancer cells are found in the normal-looking tissue around the edge of the tumor removed during surgery.

**clinical trial**

Research on a test or treatment to assess its safety or how well it works.

**combination regimen**

The use of two or more drugs.

**common bile duct**

A tiny tube that carries digestive fluid (bile) from the liver into the small intestine, which absorbs nutrients from eaten food.

**complementary medicine**

Treatment that is given along with standard treatment but is not considered standard treatment.

**complete blood count**

A test of the number of blood cells.

**computed tomography (CT)**

A test that uses x-rays from many angles to make a picture of the inside of the body.

**contrast**

A dye put into your body to make clearer pictures during imaging tests.

**CT-guided FNA biopsy**

Use of pictures from a CT scan to guide a needle to the right spot to remove a sample of tissue from the body for testing.

**diabetes**

A disease that causes high levels of sugar in the blood.

**diagnose**

To identify a disease.

**distal pancreatectomy**

Surgery that removes the middle part (body) and narrow end (tail) of the pancreas as well as other nearby organs.

**distant metastasis**

Cancer cells that have spread from the first tumor to a distant (far away) part of the body.

**duct**

A small tube or vessel in the body that fluids pass through.

**ductal adenocarcinoma**

Cancer of the cells that line the pancreatic ducts—small tubes that fluids pass through—and make proteins that digest food.

**duodenal bypass**

Surgery to re-route the path that eaten food takes from the stomach to the small intestine, which absorbs nutrients from the food.

**duodenum**

The first part of the small intestine, which absorbs nutrients from eaten food.

**endocrine cells**

Cells that make hormones—chemicals that activate cells or organs.

**endoscope**

A thin, long tube with a light and camera lens at the end that is inserted through the mouth to take pictures of the inside of the body.

**endoscopic retrograde cholangiopancreatography (ERCP)**

A test that uses x-rays and a thin, lighted tube that is inserted into the body to see the pancreatic ducts and bile ducts.

**endoscopic ultrasound (EUS)**

A test that uses a thin, lighted tube guided through the mouth and down the throat to take pictures of the inside of the body using sound waves.

**enzymes**

Proteins that help to digest food.

**EUS-guided FNA biopsy**

Use of pictures from sound waves and a thin, lighted tube inserted through the mouth to guide a thin needle to the right spot to remove a sample of tissue from the body for testing. Also called EUS-FNA.

**exocrine cells**

Cells that make proteins that help to digest food.

**external beam radiation therapy (EBRT)**

Radiation therapy (use of high-energy rays to destroy cancer cells) received from a machine outside the body.

**fatigue**

Severe tiredness despite getting enough sleep that limits one's ability to function.

**fibrosis**

The scarring of supportive fibers in tissue.

**fine-needle aspiration (FNA)**

Use of a thin needle to remove a small amount of tissue or fluid from the body to test for cancer cells.

**first-line treatment**

The first set of treatments given to treat a disease.

**fluoropyrimidine-based therapy**

A combination chemotherapy regimen in which the main drug used is 5-FU (5-fluorouracil).

**FOLFIRINOX**

A combination chemotherapy regimen that includes 5-FU, leucovorin, irinotecan, and oxaliplatin.

**Food and Drug Administration (FDA)**

A federal government agency that regulates drugs and food.

**gallbladder**

A small organ that holds digestive fluid from the liver.

**gastroenterologist**

A doctor who's an expert in diseases of the digestive system—organs that break down food for the body to use.

**gemcitabine-based therapy**

A combination chemotherapy regimen in which the main drug used is gemcitabine.

**general anesthesia**

A controlled loss of wakefulness from drugs.

**gland**

A group of cells or a small organ that makes fluids or chemicals that the body needs.

**hormones**

Chemicals in the body that activate cells or organs.

**imaging test**

A test that takes pictures (images) of the inside of the body to look for signs of disease.

**insulin**

A chemical that controls the amount of sugar in the blood.

**intensity-modulated radiation therapy (IMRT)**

Radiation therapy (use of high-energy rays to destroy cancer cells) that uses small beams of different strengths based on the thickness of the tissue.

**jaundice**

Yellowing of the skin and eyes due to a buildup of bilirubin in the body.

**laparoscope**

A thin, long tube with a light and camera lens at the end that is inserted into the body to see inside the belly area.

**laparoscopy**

A surgical test that uses a thin, lighted tube inserted through a small cut in the belly (abdomen) to see inside the belly area and possibly remove tissue for testing.

**leucovorin**

A drug that improves how well certain cancer drugs work.

**liver**

An organ that removes waste from the blood and makes bile—a fluid that helps to digest food.

**liver function tests**

Tests of the blood for chemicals made or processed by the liver to see if the liver is working well.

**local anesthesia**

A controlled loss of feeling in a small area of the body caused by drugs.

**local metastasis**

Cancer cells that have spread from the first tumor to a nearby site.

**local pancreatic cancer**

Cancer that started in and hasn't grown outside the pancreas.

**local recurrence**

Cancer that came back after treatment, but is only in or near the pancreas.

**locally advanced pancreatic cancer**

Cancer that started in the pancreas and has grown into nearby blood vessels or tissues.

**lymph**

A clear fluid containing white blood cells.

**lymph node**

Small groups of special disease-fighting cells located throughout the body.

**lymph vessel**

Tube-shaped ducts that carry lymph throughout the body.

**magnetic resonance cholangiopancreatography (MRCP)**

A test that uses radio waves and powerful magnets to make very clear pictures of the pancreas and bile ducts—tiny tubes that drain digestive fluid (bile) from the liver.

**magnetic resonance imaging (MRI)**

A test that uses radio waves and powerful magnets to make pictures of the inside of the body showing the shape and function of body parts.

**main pancreatic duct**

A small tube in the body that drains digestive fluids from the pancreas into the first part of the small intestine (duodenum).

**medical history**

All health events and medications taken to date.

**metastases**

Tumors formed by cancer cells that spread from the first tumor in the pancreas to other parts of the body. (Plural for metastasis.)

**metastasis**

Cancer that has spread from the first tumor to another body part.

**metastatic pancreatic cancer**

A tumor that started in the pancreas and has spread to distant sites in the body.

**metastatic recurrence**

Cancer that came back after treatment and has spread to sites far away from the pancreas.



**microscope**

A tool that uses lenses to see things the eyes can't.

**multidisciplinary**

Includes a number of doctors and other health professionals who are experts in different areas of cancer care.

**neoadjuvant treatment**

The treatment given before the main treatment used to rid the body of cancer.

**organ**

A part of the body that performs a certain function.

**palliative care**

Treatment for the health conditions caused by pancreatic cancer or cancer treatment.

**pancreas**

An organ that makes fluids that help digest food and chemicals that control blood sugar.

**pancreatic duct**

A small tube in the pancreas that digestive fluids pass through.

**pancreatic protocol CT or MRI**

A CT or MRI scan that is done in a certain way so that all of the pictures focus specifically on the pancreas to clearly show the pancreas, nearby blood vessels, and very tiny tumors.

**pancreatoduodenectomy**

Surgery to remove the widest part (head) of the pancreas and parts of other nearby organs. Also called Whipple procedure.

**pathologist**

A doctor who's an expert at testing cells and tissue for disease.

**percutaneous endoscopic gastrostomy (PEG) tube**

A tube inserted through a cut in the belly area (abdomen) and placed into the stomach to give food.

**performance status**

A rating of a person's symptoms and ability to do daily activities.

**physical exam**

A review of the body by a health expert for signs of disease.

**primary treatment**

The main treatment used to rid the body of cancer.

**primary tumor**

The first mass of cancer cells in the body.

**radiation therapy**

The use of high-energy rays (radiation) to destroy cancer cells.

**radiologist**

A doctor who's an expert in reading imaging tests.

**recurrence**

The return of cancer after treatment.

**resectable**

Cancer that can be removed by surgery.

**second-line treatment**

The next treatment(s) given when the first or previous treatment failed.

**sedative**

A drug that helps a person to relax or go to sleep.

**side effect**

An unplanned or unwanted physical or emotional response to treatment.

**small intestine**

The digestive organ that absorbs nutrients from eaten food.

**spleen**

An organ to the left of the stomach that helps to protect the body against disease.

**stent**

A small plastic or metal tube-shaped device used to unblock a duct—tube-shaped vessel in the body that fluids pass through.

**stomach**

An organ that helps to digest food by mixing it with digestive juices to turn solid food into liquid.

**superior mesenteric artery**

The large, tube-shaped vessel that carries blood from the heart to the intestines.

**superior mesenteric vein**

The large, tube-shaped vessel that returns blood from the intestines back to the heart.

**supportive care**

Treatment for the symptoms or health conditions caused by cancer or cancer treatment.

**surgeon**

A doctor who's an expert in operations to remove or repair a part of the body.

**surgery**

An operation to remove or repair a part of the body.

**surgical margin**

The normal-looking tissue around the edge of the tumor removed during surgery.

**targeted therapy**

Treatment with drugs that specifically target cancer cells.

**total pancreatectomy**

Surgery to remove the entire pancreas and other nearby organs and tissues.

**unresectable**

Cancer that can't be removed by surgery.

**Whipple procedure**

Surgery to remove the head of the pancreas and parts of other nearby organs. Also called pancreatoduodenectomy.

## Acronyms

**3D-CRT**

three-dimensional conformal radiation therapy

**5-FU**

5-fluorouracil

**CAM**

complementary and alternative medicine

**CT**

computed tomography

**EBRT**

external beam radiation therapy

**ERCP**

endoscopic retrograde cholangiopancreatography

**EUS**

endoscopic ultrasound

**EUS-FNA**

endoscopic ultrasound–guided fine-needle aspiration

**FDA**

Food and Drug Administration

**FNA**

fine-needle aspiration

**FOLFIRINOX**

folinic acid + 5-fluorouracil + irinotecan + oxaliplatin

**IMRT**

intensity-modulated radiation therapy

**MRCP**

magnetic resonance cholangiopancreatography

**MRI**

magnetic resonance imaging

**SABR**

stereotactic ablative radiotherapy

## NCCN Abbreviations and Acronyms

**NCCN®**

National Comprehensive Cancer Network®

**NCCN Patient Guidelines®**

NCCN Guidelines for Patients®

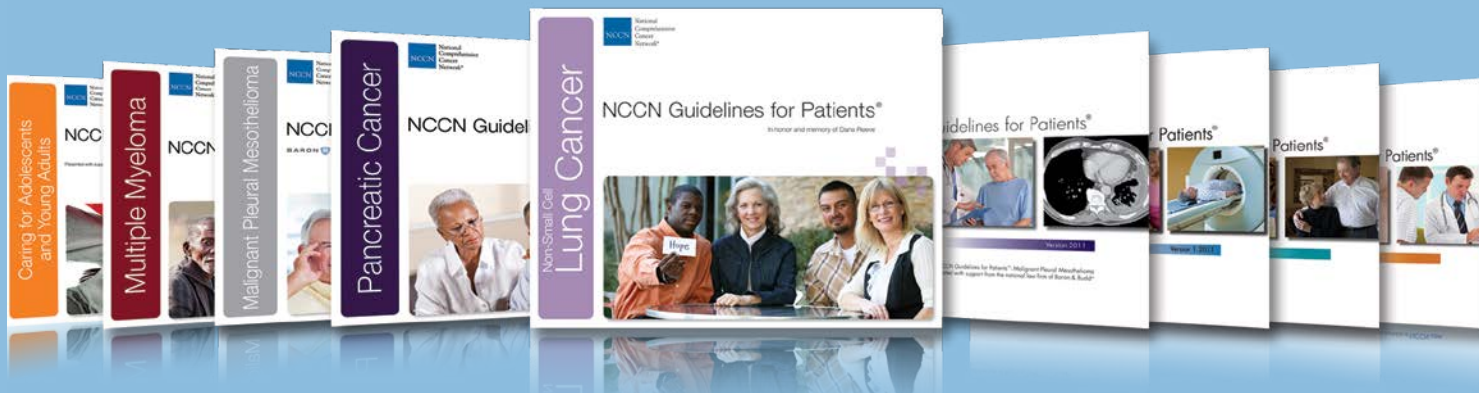
**NCCN Guidelines®**

NCCN Clinical Practice Guidelines in Oncology®

# NCCN Guidelines for Patients®

The same authoritative sources referenced by physicians and other health care professionals are available for patients:

- Caring for Adolescents and Young Adults
- Chronic Myelogenous Leukemia
- Colon Cancer
- Esophageal Cancer
- Lung Cancer Screening
- Malignant Pleural Mesothelioma
- Melanoma
- Multiple Myeloma
- Non-Small Cell Lung Cancer
- Ovarian Cancer
- Pancreatic Cancer
- Prostate Cancer
- Stage 0 Breast Cancer
- Stages I and II Breast Cancer
- Stage III Breast Cancer
- Stage IV Breast Cancer



Available at [NCCN.org/patients](http://NCCN.org/patients)

To request a printed copy, e-mail: [patientguidelines@nccn.org](mailto:patientguidelines@nccn.org)



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The following information will be sent upon request: (A) A full and fair description of the programs and activities of NCCN Foundation; and (B) A financial statement or summary which shall be consistent with the financial statement required to be filed with the Secretary of State pursuant to Code Section 43-17-5. **KANSAS:** The annual financial report for NCCN Foundation, 275 Commerce Drive, Suite 300, Fort Washington, PA 19034, 215-690-0300, State Registration # 445-497-1, is filed with the Secretary of State. **MARYLAND:** A copy of the NCCN Foundation financial report is available by calling NCCN Foundation at 215-690-0300 or writing to 275 Commerce Drive, Suite 300, Fort Washington, PA 19034. For the cost of copying and postage, documents and information filed under the Maryland charitable organizations law can be obtained from the Secretary of State, Charitable Division, State House, Annapolis, MD 21401, 1-410-974-5534. **MICHIGAN:** Registration Number MICS 45298. **MISSISSIPPI:** The official registration and financial information of NCCN Foundation may be obtained from the Mississippi Secretary of State's office by calling 888-236-6167. Registration by the Secretary of State does not imply endorsement by the Secretary of State. **NEW JERSEY:** INFORMATION FILED WITH THE ATTORNEY GENERAL CONCERNING THIS CHARITABLE SOLICITATION AND THE PERCENTAGE OF CONTRIBUTIONS RECEIVED BY THE CHARITY DURING THE LAST REPORTING PERIOD THAT WERE DEDICATED TO THE CHARITABLE PURPOSE MAY BE OBTAINED FROM THE ATTORNEY GENERAL OF THE STATE OF NEW JERSEY BY CALLING (973) 504-6215 AND IS AVAILABLE ON THE INTERNET AT [www.njconsumeraffairs.gov/ocp.htm#charity](http://www.njconsumeraffairs.gov/ocp.htm#charity). REGISTRATION WITH THE ATTORNEY GENERAL DOES NOT IMPLY ENDORSEMENT. **NEW YORK:** A copy of the latest annual report may be obtained from NCCN

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## **Margaret A. Tempero, MD / Chair**

*UCSF Helen Diller Family  
Comprehensive Cancer Center*

## **Mokenge P. Malafa, MD / Vice Chair**

*Moffitt Cancer Center*

Stephen W. Behrman, MD

*The University of Tennessee  
Health Science Center*

Al B. Benson III, MD

*Robert H. Lurie Comprehensive Cancer  
Center of Northwestern University*

Ephraim S. Casper, MD

*Memorial Sloan Kettering Cancer Center*

E. Gabriela Chiorean, MD

*Fred Hutchinson Cancer Research Center/  
Seattle Cancer Care Alliance*

Vincent Chung, MD

*City of Hope Comprehensive Cancer Center*

Steven J. Cohen, MD

*Fox Chase Cancer Center*

Brian Czito, MD

*Duke Cancer Institute*

Mary Feng, MD

*University of Michigan  
Comprehensive Cancer Center*

William G. Hawkins, MD

*Siteman Cancer Center at Barnes-  
Jewish Hospital and Washington  
University School of Medicine*

Joseph Herman, MD, MSc

*The Sidney Kimmel Comprehensive  
Cancer Center at Johns Hopkins*

John P. Hoffman, MD

*Fox Chase Cancer Center*

Andrew Ko, MD

*UCSF Helen Diller Family  
Comprehensive Cancer Center*

Srinadh Komanduri, MD

*Robert H. Lurie Comprehensive Cancer  
Center of Northwestern University*

Albert Koong, MD, PhD

*Stanford Cancer Institute*

Andrew M. Lowy, MD

*UC San Diego Moores Cancer Center*

Wen Wee Ma, MD

*Roswell Park Cancer Institute*

Nipun B. Merchant, MD

*Vanderbilt-Ingram Cancer Center*

Sean J. Mulvihill, MD

*Huntsman Cancer Institute  
at the University of Utah*

Peter Muscarella II, MD

*The Ohio State University Comprehensive  
Cancer Center - James Cancer Hospital  
and Solove Research Institute*

Eric K. Nakakura, MD

*UCSF Helen Diller Family  
Comprehensive Cancer Center*

Jorge Obando, MD

*Duke Cancer Institute*

Martha B. Pitman, MD

*Massachusetts General Hospital  
Cancer Center*

Sushanth Reddy, MD

*University of Alabama at Birmingham  
Comprehensive Cancer Center*

Aaron R. Sasson, MD

*Fred & Pamela Buffett Cancer Center at  
The Nebraska Medical Center*

Anitra Talley

*Pancreatic Cancer Action Network (PanCAN)*

Sarah P. Thayer, MD, PhD

*Massachusetts General Hospital  
Cancer Center*

Colin D. Weekes, MD, PhD

*University of Colorado Cancer Center*

Robert A. Wolff, MD

*The University of Texas  
MD Anderson Cancer Center*

Brian M. Wolpin, MD, MPH

*Dana-Farber/Brigham and  
Women's Cancer Center*

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# NCCN Member Institutions

**Fred & Pamela Buffett Cancer Center at The Nebraska Medical Center**  
Omaha, Nebraska  
800.999.5465  
[nebraskamed.com/cancer](http://nebraskamed.com/cancer)

**City of Hope Comprehensive Cancer Center**  
Los Angeles, California  
800.826.4673  
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**Dana-Farber/Brigham and Women's Cancer Center Massachusetts General Hospital Cancer Center**  
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877.332.4294  
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[massgeneral.org/cancer](http://massgeneral.org/cancer)

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[dukecancerinstitute.org](http://dukecancerinstitute.org)

**Fox Chase Cancer Center**  
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[foxchase.org](http://foxchase.org)

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877.585.0303  
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**Fred Hutchinson Cancer Research Center/Seattle Cancer Care Alliance**  
Seattle, Washington  
206.288.7222 • [seattlecca.org](http://seattlecca.org)  
206.667.5000 • [fhcrc.org](http://fhcrc.org)

**The Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins**  
Baltimore, Maryland  
410.955.8964  
[hopkinskimmelcancercenter.org](http://hopkinskimmelcancercenter.org)

**Robert H. Lurie Comprehensive Cancer Center of Northwestern University**  
Chicago, Illinois  
866.587.4322  
[cancer.northwestern.edu](http://cancer.northwestern.edu)

**Mayo Clinic Cancer Center**  
Phoenix/Scottsdale, Arizona  
Jacksonville, Florida  
Rochester, Minnesota  
800.446.2279 • Arizona  
904.953.0853 • Florida  
507.538.3270 • Minnesota  
[mayoclinic.org/departments-centers/mayo-clinic-cancer-center](http://mayoclinic.org/departments-centers/mayo-clinic-cancer-center)

**Memorial Sloan Kettering Cancer Center**  
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800.525.2225  
[mskcc.org](http://mskcc.org)

**Moffitt Cancer Center**  
Tampa, Florida  
800.456.3434  
[moffitt.org](http://moffitt.org)

**The Ohio State University Comprehensive Cancer Center - James Cancer Hospital and Solove Research Institute**  
Columbus, Ohio  
800.293.5066  
[cancer.osu.edu](http://cancer.osu.edu)

**Roswell Park Cancer Institute**  
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877.275.7724  
[roswellpark.org](http://roswellpark.org)

**Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine**  
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[siteman.wustl.edu](http://siteman.wustl.edu)

**St. Jude Children's Research Hospital/The University of Tennessee Health Science Center**  
Memphis, Tennessee  
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901.683.0055 • [westclinic.com](http://westclinic.com)

**Stanford Cancer Institute**  
Stanford, California  
877.668.7535  
[cancer.stanford.edu](http://cancer.stanford.edu)

**University of Alabama at Birmingham Comprehensive Cancer Center**  
Birmingham, Alabama  
800.822.0933  
[www3.ccc.uab.edu](http://www3.ccc.uab.edu)

**UC San Diego Moores Cancer Center**  
La Jolla, California  
858.657.7000  
[cancer.ucsd.edu](http://cancer.ucsd.edu)

**UCSF Helen Diller Family Comprehensive Cancer Center**  
San Francisco, California  
800.689.8273  
[cancer.ucsf.edu](http://cancer.ucsf.edu)

**University of Colorado Cancer Center**  
Aurora, Colorado  
720.848.0300  
[coloradocancercenter.org](http://coloradocancercenter.org)

**University of Michigan Comprehensive Cancer Center**  
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800.865.1125  
[mcancer.org](http://mcancer.org)

**The University of Texas MD Anderson Cancer Center**  
Houston, Texas  
800.392.1611  
[mdanderson.org](http://mdanderson.org)

**Vanderbilt-Ingram Cancer Center**  
Nashville, Tennessee  
800.811.8480  
[vicc.org](http://vicc.org)

**Yale Cancer Center/Smilow Cancer Hospital**  
New Haven, Connecticut  
855.4.SMILOW  
[yalecancercenter.org](http://yalecancercenter.org)

## My notes

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275 Commerce Drive  
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Fort Washington, PA 19034  
215.690.0300

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